ARCHIVES OF OPHTHALMOLOGY.

GUMMATOUS INVASION OF THE BONE, SKIN, CONJUNCTIVA, RETINA AND UVEAL TRACT. COMPLETE AND RAPID RECOVERY.

By Dr. A. BARKAN, San Francisco, Cal.

(*With an illustration on Text Plate III.*)

In Finger's book on syphilis and venereal diseases, we find the following: "But a few cases of gummatous ulcerations of the conjunctiva have been described. They develop either from a continuation of the gummata of the lids to the conjunctiva, or primarily in the latter. The yellowish-red tumor forms first under the conjunctiva. Its surface is smooth. After a while it ulcerates in one spot, forming irregular edges and having an infiltrated bottom. A certain diagnosis can be made only if other symptoms of lues are in evidence."

The following case, characterized by a most impetuous onset of gummata in different parts of the body, and by an exceedingly rapid yielding to mercurial treatment of moderate intensity, may prove of interest:

Mrs. X.Y. Has a fairly good family history. Father sixty-four years of age; well until four years ago; died of grippe. Mother is sixty years, in best of health. The whole family consists of three brothers and four sisters, all enjoying good health, except one sister who has been ill since birth of child. Patient, who is next to the youngest sister, is of rather pale complexion, but has been in good health up to two years ago, when her health gradually failed, as she thinks, from the climbing of stairs and doing much work on the sewing-machine. From 135 pounds she decreased to 110 in a few months.

The submaxillary glands increased in size, also some of the cer-

vical glands, the swelling increasing and decreasing at different times. Patient complained of feeling feverish in the afternoons, but had no eruption of any kind on the skin.

She married on the 3d of August, 1898. One month later, the right eye became inflamed and slightly blurred. It was not particularly painful. The attending physician prescribed arsenic to build her up. Two weeks afterwards, the first breaking out on the skin commenced. Two small papulous elevations ("pimples") appeared on each wrist and one at the root of the nose toward the inner extremity of the right eyebrow. Increasing in size they repeatedly discharged, causing the patient to press them out. Next a similar spot showed itself on the shoulder, and quickly in succession four or five large ones on the small of the back, three on the left leg near the knee joint, then a very marked surface swelling on both legs along the front aspect of the bone.

On the 12th of October, 1898, her condition was the following: Anæmic patient, flabby skin. All the numerous exanthemata mentioned above presented livid reddish patches with indurated bases; their grayish bottoms were covered by crusts. Secretion scant. On both legs the gummata were almost as large as the vola manus, soft and pasty. Painless on pressure.

Right eye: Slight circumcorneal injection, lower two thirds of the cornea hazy, resembling a condition of interstitial keratitis. Pupil moderately but irregularly enlarged. Iris discolored, texture indistinct. Its inner half yellowish red, thickened by a number of prominent confluent small gummata. Slight capsular opacity. Opacities in the vitreous; fundus not visible. V = $\frac{2}{60}$ with plus 1.5.

Left eye: Palpebral conjunctiva slightly hyperæmic. From lower fornix a tumor the size of a hazel-nut extends towards the lower margin of the cornea, overlapping it in part. The ocular conjunctiva covering it is intensely red all over the lower half of the ball. The top of the tumor shows a gray spot. The tumor is not movable but the ocular conjunctiva over it can be slightly moved. Pupil well enlarged from atropine. No iritis. Opacities of the vitreous. Fundus indistinct. V = $\frac{2}{60}$ with plus 1.5.

There is and has been a remarkable absence of pain both in the left and right eye throughout. By inunctions of twenty grains of blue ointment twice a day, twenty grains of iodide of potassium twice a day, mercurial plaster applied to the sores, and locally mild applications of atropine, she improved within a week in

an astonishing way. The top of the gummata commenced to sink in and the ocular tumor disappeared as if by magic, all other sores also healing. Within a fortnight the ocular gummata were almost gone, without having at any time shown a tendency to ulcerate, having "caved in," as it were, and become absorbed. At the same time the opacities of the vitreous had cleared up, and now the fundus revealed the condition of neuro-retinitis of a mild degree. Under the same treatment, never resorting to larger doses of either mercury or iodide, never administering mercury internally, and proceeding simultaneously with mercury and iodide, the patient made a most rapid recovery. Even the large gummata below the knee showed hardly any traces of existence at the end of November.

After about seven weeks of treatment the visual condition of the eyes was pretty satisfactory. Vision, right, $\frac{20}{30}$; cornea and other media fairly clear. Vision, left, $\frac{20}{20}$.

Needless to say that even after such apparently rapid recovery the same treatment was continued for some time longer, milder doses being given both of mercury and iodide. Local examination could not be made.

Patient was married, as far as I knew. She had no children. I saw her from time to time for a couple of years; there was no recurrence of the trouble. She appeared to be in good health and was in a happy state of mind.

AN EYELASH IN THE ANTERIOR CHAMBER. REMOVAL.

By Dr. JOHN DUNN, Richmond, Va.

In March, 1902, I was consulted by Mr. L. aged twenty, who told me he had "an eyelash over the sight" of his left eye. About two months previously, Mr. L. had been struck in this eye by a piece of steel from a hammer. I first saw Mr. L's eye two days after the accident. It was then so sensitive to the touch and to light that minute examination of it, except under chloroform, was not possible. Repeated instillations of cocaine produced but slight lessening of either the pain or the intolerance of light. I made out, however, that the tension was normal and that there was over the pupil a relatively large area from which the superficial layers of the cornea had been torn away. After dilatation of the pupil with atropia, the fundus reflex was found to be normal in color. I could make out nothing to suggest hemorrhage into the vitreous, detachment of the retina, injury to the iris or lens. There was no blood in the anterior chamber. The details of the fundus could not be seen. No evidences of infection. Mr. L. claimed that although light was very painful there was absolutely no vision in the eye. An atropia salve and hot applications were ordered. At the end of three weeks, the eye, although still abnormally sensitive to light and over the upper-central ciliary region to touch, was no longer visibly irritated. A faintly nebulous condition of the cornea showed the seat of the injury. The vision was about $\frac{1}{10}$. The fundus as seen by the indirect method was normal. The surface of the cornea had healed unevenly, and examined by the direct method the retinal vessels appeared blotched. The corneal astigmatism accounted for the poor vision. The pupil was dilated ad maximum from the atropia. The color of the iris was normal and no special examination was

made of its surface. Mr. L. was asked to return later to see if glasses would improve his vision. His next visit was about five weeks later and was occasioned by his brother discovering "a lash over the sight of the eye." All undue sensitiveness of the eye had now disappeared. The pupil had contracted normally. The vision was slightly better. In the anterior chamber was an eyelash, apparently of full length. The root end of the lash lay in the angle between the iris and the cornea. The lash extended downward and outward across the iris, the point lying in the irido-corneal angle below. It did not cross the pupillary area. The patient was not conscious of the presence of the lash, which had accidentally been discovered by his brother who was examining the eye out of curiosity.

With a *triangular iridectomy knife a section of the cornea was made*, the centre of the cut being opposite the root end of the lash. The instant the aqueous escaped and the iris was thrown against the corneal angle the lash disappeared from view; it had been washed by the escaping aqueous into the angle and it required very careful examination to see any part of it. I was next obliged to enlarge the corneal section with a pair of blunt scissors, not altogether a safe or desirable thing to do under the circumstances, for any injury causing the iris to bleed would put an end to the efforts to extract the lash, which would then have become invisible. The iris, however, was not injured, and with the aid of a flexible blunt hook the lash was found and removed. This hook was passed flat along the surface of the iris opposite the centre of the lash and then turned at right angles and withdrawn. Fortunately the lash, which proved to be 8 *mm* long, was caught by the hook. The wound healed normally.

The above case has been reported because of the difficulty I experienced in removing the lash, owing to the fact that my original corneal section was wrongly placed. I had supposed that a small section near the big end of the lash would allow me to grasp it and thus easily withdraw it. When, however, the anterior chamber had been emptied and the iris had been driven into the angle, this was found to be impracticable. In the first place, I could no longer see the lash save for a small segment near its centre, and I could only grasp iris tissue with the forceps.

The case seems to teach that the proper place for a corneal

section, made to remove an eyelash from the anterior chamber, is opposite the centre of the lash, not opposite either end; and, further, that the section should not be a small one. A flexible blunt hook is probably the best instrument we have to use in the extraction of a lash after the corneal section has been made.

The eyelash was driven into the anterior chamber by the piece of iron which caused the corneal injury. Exactly how a lash 8 *mm* long could have been forced into the anterior chamber in so rough a manner and through a wound so small as to heal within two days sufficiently for the eye to have normal tension is rather puzzling. The point to be made in connection with the case is that the lash remained in the anterior chamber for eight weeks without causing any infection.

In the only other case of the kind that ever came under my observation, the lash, which at first glance was mistaken for a partial separation of the sphincter pupillæ, was under closer examination found to be surrounded its whole length by pus, which existed nowhere else in the anterior chamber. In this case the eye had been badly injured; cyclitis developed and, later, sympathetic ophthalmia, from which, however, after enucleation of the injured eye and many weeks of treatment, the patient recovered with perfect vision, which is retained to the present, *i. e.*, about six years.

CLEARING UP OF TRAUMATIC CATARACT. REPORT OF A CASE.

By Dr. JAMES J. MILLS, Baltimore.

B. F., from Norfolk, Va., age nineteen, a teacher, consulted me on July 7, 1901, on account of an injury to his left eye three days before, which had rendered him blind on this side. He was tampering with a small cannon, July 4th, which exploded, the flying powder striking his eye. Upon inspection there was to be seen a small opacity in the cornea, to the nasal side. Projecting from the anterior surface of the iris, on the same side, was a grain of giant gunpowder; this also passed through, and was in contact with the anterior capsule of the lens. The lens was smoky, with striæ radiating from the centre, this throughout, excepting a narrow band around the extreme periphery, above, below, and to the temporal side. No fundus examination could be made with the ophthalmoscope, though at the temporal side and through the periphery a blurred view of the retinal vessels could be obtained. There was marked ciliary injection, slight swelling of the iris, and hypopyon. Fingers could not be counted, and only the direction of shadows was perceived. The patient strongly objected to surgical interference for the removal of the powder. (To this I yielded, remembering a patient who came to me a year before with a large grain of gunpowder lying in the bottom of the anterior chamber, who also objected to its removal; and at the end of six months it had disappeared, leaving the eye as perfect as before it entered.) A collyrium of sulph. atropiæ, bandage, and broken doses of calomel were prescribed. During the next few days the irido-cyclitis showed signs of subsiding, and in less than a week the hypopyon had disappeared. At the end of two weeks the lens was markedly clearing in the centre, so that a blurred fundus could be made out, and at the end of three weeks the lens was almost transparent, with the exception of the capsular portion in

contact with the powder. Inflammation having disappeared, the patient, feeling comfortable, was permitted to return to his home. At my request he paid me a visit six months after the injury. The fragment of gunpowder was still to be seen projecting from the posterior surface of the iris, though much diminished in size, the portion from the anterior surface being no longer visible, a circumscribed discoloration occupying its place. The lens was perfectly transparent, with the exception of the seat of injury, where a densely opaque and sharply circumscribed capsular opacity existed. This was about 2 *mm* across and about 1 *mm* in width, and situated behind the iris. V = $\frac{20}{20}$ + — without refractive error. Pupil is slightly oval in direction of powder. His eye is entirely free from irritation, and he experiences no discomfort in his daily work. There was doubtless a small perforation in the capsule, which closed, and the opaque lens substance cleared up. The particle of powder may possibly have prevented more of the aqueous humor from entering, and thus assisted in the permanent closure.

The clearing up of partial traumatic cataracts occurs in animals, for instance, rabbits, very readily, but in man it occurs seldom. A few years ago Knapp showed a case at a meeting of the Section on Ophthalmology, N. Y. Academy of Medicine.

A man of about twenty-five years was hurt in the right eye by a particle of steel which penetrated through the cornea, iris, and lens in the temporal part, and was seen to float in the vitreous a few days after the injury. The lens was opaque in the temporal half. The doctor extracted the particle of steel with Haab's magnet, drawing it through the zonula of Zinn into the anterior chamber, and through a small incision in the cornea out of the eye. Nothing of importance was injured. In the course of six weeks the lens had so far cleared up that only the passage of the chip through the lens was visible as a sharp line from in front straight backward. The remainder of the lens continued clear. The patient was permanently cured, with V = $\frac{20}{20}$.

Rudolf Plaut (Kiel, 1887), *Ein Fall von spontaner Aufhellung einer Katarakt*, page 28. Under this kind of cataract I group two cases of Rydel's, to whose original paper ("Bericht über die Augenklinik der Wiener Univ., 1863–1865," Wien, 1867) I regret not to have access. Source of information is Schmidt's *Jahrbuch*, 1867.

After a bolt shot (Bolzenschuss) in the eye, which penetrated cornea and iris, a marked irritation was set up. In the lens was to be seen an opaque, conical strand, which began behind the laceration of the iris and extended into the posterior cortical layers. In the neighborhood of the posterior end of the puncture there was formed very quickly a radiate, centrifugally streaming opacity of each layer. Atropia was instilled and cold applications were made. About five days after the accident the interstices between the opaque stripes appeared somewhat clearer. This, after eleven more days, stretched around the whole circumference of the opaque area. Three weeks later, the diameter of the opacity was about $\frac{1}{2}$ *mm* less, and the opacity was less dense, allowing the fundus to be seen better than before. The further clearing up of the opacity took place from centre to periphery, opaque points showing as nebules at first, and disappearing gradually one after another. Later the margin of the opacity split up into wedge-shaped clefts, by which means the opacity with its clear centre gradually presented a toothed appearance. In nine months the process had ended. Two years after the accident there remained but few traces of the tooth-like stripes, and these were transparent. The part of the puncture remained opaque at its margin; the middle was transparent.

Case No. 2 (Plaut). — In this case a fine steel splinter was driven through cornea, iris, and lens. The posterior cortical layers appeared cloudy, while the nucleus and anterior cortical layers remained transparent. After three months the opacity cleared up, partly in the middle, partly in the border, and was reduced to a very much diminished marginal clouding. Plaut mentions two cases of Desmarres (fils) presented in his *Clinical Lectures on Ocular Surgery*. According to Becker (p. 280) he writes word for word: "We have removed a foreign body which, after having traversed the cornea and iris, had transfixed the lens and penetrated into the vitreous body. In spite of this wound, the lens has not lost its transparency a single moment."

The following case sounds still less credible: A man, by a false blow given to a nail, shattered it into fragments. One of the fragments entered the eye with considerable force, piercing the cornea, and lodging in the lens. Twenty-four hours after the accident, the lens was completely opaque. Desmarres deferred operation, and that to the great benefit of the patient, for seventy-

two hours after the accident the lens had become completely transparent.

Plaut also remarks:

As incredible as both these cases seem, I do not think they should be ignored, especially as a case kindly given over to me by Prof. Völckers, in spite of severe complications, ended in a complete clearing up of the lens.

K. W., from Switzerland, æt. twelve, male. Before he was two and a half years old, his right eye was injured by a thrown stone. Immediately after the injury there was very great swelling of the lids, and œdema of the conjunctiva. After the disappearance of the swelling there was great diminution of vision. He was taken to an oculist, who made out a circumscribed cloudiness in the anterior layers of the lens, and rupture of choroid. After the lapse of a year the parents noticed a marked clouding of the pupil. The pupillary region became gray, and after still another year was quite grayish white. The power of vision was reduced to simple quantitative light perception. On December 29, 1894, the patient presented himself for treatment. After dilatation of the pupil, a horizontal band-like opacity was to be seen beneath the anterior lens capsule. This extended across the pupillary region like a stripe. At this point the capsule appeared to be somewhat contracted, at any rate the lens behind this was clouded irregularly. The remainder of the lens was diffusely opaque and of a grayish-yellow color. A faint suggestion of the lens sectors could be made out. The fundus could not be made out, merely presenting a slightly reddish appearance. There was only the trace of a scar in either cornea or capsule, this behaving quite like a cataract produced by a stone striking the cornea and contusing the lens, without breaking the capsule. Removal of the lens (by discission) in the course of the next summer was agreed upon, and this for cosmetic considerations. The demonstrated choroid rupture obviated hope of his regaining sight. At the beginning of July the patient presented himself for operation. His mother had already written that since Easter a marked change had taken place in the lens opacity, and, indeed, the appearance of the eye was quite changed. Up to the band-like opacity in the capsule the lens was quite transparent. It was quite possible to examine the eye with the ophthalmoscope. The fundus showed the red reflex. All that remained was a stellate opacity in the

posterior cortical layers, such as is so frequently observed after trauma. It was even possible to distinguish a few vessels and the color of the papilla, but details were not yet clear. As to his vision, he read very easily larger capitals at a distance of three quarters of a metre, only he sought for a long time the more favorable position. This gave the impression that there was a large central scotoma, yet such a condition was not demonstrated with certainty. Under these circumstances the operation was abandoned, as now on cosmetic grounds even, there was no occasion for it.

It is pretty well known that opacities following a small wound of the capsule sometimes remain stationary, and less frequently disappear. They are referred to by Nettleship, for example, and, I understand, also by Praun in his recent work on *Die Verletzungen des Auges.* My own case I consider notable, however, from the fact that the opacity was so wide-spread, and the subsequent clarification so marked.

SOME OBSERVATIONS ON A CASE OF TOTAL COLOR BLINDNESS.

By Prof. W. A. NAGEL, Freiburg-im-Breisgau.

Abridged Translation by Dr. Ward A. Holden, from *Arch. f. Augenh.*, Vol. XLIV., 2.

(*With three figures in the text.*)

THROUGH the kindness of Dr. E. v. Hippel, at Heidelberg, I recently had opportunity to see another case of total color blindness, and to examine the patient with him.

Since the time that we could have him under examination was limited, we confined ourselves to the more interesting points, such as the determination of a central scotoma and experiments with after-images. It seemed advisable to omit accurate determinations of the acuteness of vision, since this had been done carefully in the most recent case, reported at the Heidelberg meeting last year.

The history as obtained by Dr. v. Hippel was as follows:

The patient came April 29, 1901, to find whether his poor vision could be improved. From an early age his sight had been poor, but of late years it had grown rather better than worse. At first he said nothing of defective color vision. In the family, so far as is known, there are no cases of defective color sense and there was no consanguinity of parents or grandparents. The patient stated that in bright daylight he does not see well and is easily dazzled, but with artificial illumination, as in a café in the evening, he recognizes acquaintances with difficulty. He has concave glasses of 10 dioptries but does not wear them regularly.

R, with $-7.D$ V $= \frac{3}{60}$ when the chart is strongly illuminated, and V $= \frac{3}{5}$ when the illumination is considerably diminished.

Schweigger 0.6 was read at 5 *cm* with difficulty without glasses.

Stronger concave glasses did not improve distant vision.

L, counted fingers at 1 *m;* read Schweigger 11. Distant vision not improved with glasses.

The limits of the field of vision were normal in the right eye, and apparently so in the left, although a nystagmus made this difficult to determine.

In distant vision the left eye diverged in a pronounced manner. When an object was looked at, the right eye fixated it while the left exhibited a horizontal nystagmus. It was possible, however, to maintain binocular fixation for a few seconds when the object was brought close to the eyes. When prisms were held vertical double images were seen, one directly above the other. Stereoscopic vision with simple figures could not be produced, doubtless because of the poor vision in the left eye.

When the right eye was kept shut all objects seemed to undergo rapid movements corresponding to the nystagmus.

The refractive media were clear. The right disc was perhaps paler than the left but within physiological limits. There was staphyloma posticum about $\frac{3}{4}$ p.d. in width, directed downward and outward. In the macular region was a round sharply outlined reddish-yellow patch, as large as the disc, with small spots of pigment on it. The condition was very similar to that represented in Fig. 47.1, in Haab's atlas (third edition).

When the patient was asked to look directly into the mirror, he used a portion of the retina to the temporal side of the spot so that in the inverted image the margin of the patch to the left side was just visible.

In the left eye the conditions as regards the staphyloma and the patch at the macula were similar to those in the right.

Since the ophthalmoscopic condition would not fully account for the poor vision an examination was made with squares of colored paper, where the defect in the color sense was at once revealed.

In reply to questions the patient stated that he had never seen colors well, but he named colors, and when the test worsteds were laid before him he designated some rightly and some wrongly.

A rapid test with the color disc, which could only be carried out at the first examination, showed that if any two colored papers

were compared the mixture of a certain amount of black with one color produced an apparent color equivalency of the two. It was also seen at once that a luminous red appeared nearly black.

With a fairly dark smoked glass the patient saw better in bright daylight, but in the evening this glass reduced his acuteness of vision.

These first observations showed that we had to do with a typical case of total color blindness; later detailed examination confirmed this.

It was interesting to find that the patient frequently used color terms and believed that he failed only in distinguishing the finer shades of color. Blue, yellow, red, and green he believed he distinguished perfectly.

When I laid before him a number of discs of colored paper and asked him to select blue he pointed to a yellowish-brown paper; a purple-red was called gray, and so forth. Apparently he used color designations without any knowledge of their significance or of the conception "color."

The diagnosis was rendered absolute by making color equivalents on the rotating disc.

One of the questions which interested us chiefly was that in regard to the existence of a central scotoma. Koenig found such a scotoma in his case and used this fact to support his theory. Various persons then seemed to think it of importance for Koenig's theory as well as for v. Kries's "rod theory" if cases of total color blindness were found without a central scotoma. However, both Koenig and v. Kries have stated that the existence of a blind spot at the fovea is not essential, since in place of the lacking typical cones, percipient elements having the physiological character of rods could be present. Since we do not know the causes leading to the production of an eye with achromatic vision, and do not know whether there is an actual congenital anomaly of structure, a later lack of development, or a pathological condition acquired in intra- or extra-uterine life, it is too early to draw up theoretical laws, and at the most we can speak only of probabilities.

In cases of total color blindness recently examined, Uhthoff, Abney, and Axenfeld have found central scotomas, and the first-named author has now found by the use of new methods a central scotoma in the case previously reported by Prof. A. v. Hippel.

A case studied in the physiological institute at Freiburg some years ago was not found to have a central scotoma. Whether the absence of a scotoma in this and other cases was actual or due to defective examination is questionable. In the Freiburg case the ophthalmoscope revealed the presence in the fovea of one eye of a small lustrous white and a small black spot, that seemed incompatible with a normal function of this portion of the retina.

There was doubtless a very small scotoma which escaped observation when the field was examined. With Mr. H., a scotoma was readily made out in each eye. A first examination, with a ring-shaped object of observation, with which Uhthoff had been successful, led to no result. When he was directed to look at the ring he saw constantly a small white test object moved about within the ring.

The following test was successful: On dark gray paper white discs 3 *mm* in diameter were arranged as in Fig. 1.

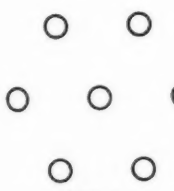

FIG. 1.

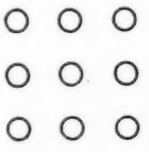

FIG. 2.

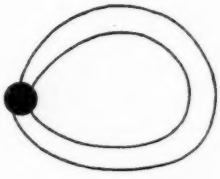

FIG. 3.

When directed to fixate the centre disc with the right eye and make a statement in regard to the visibility of the others, he explained that the right upper disc was indistinct and blurred.

On fixating the centre disc in Fig. 2, the right upper disc appeared indistinct and the indistinctness was more marked when the left lower disc was fixated. When he fixated the right lower disc or any one of the upper discs, the other discs

appeared "equally distinct." His answers were so precise that there could be no doubt but that there was disturbance above and to the right of the point of fixation. And this was further confirmed by using a fixed point of fixation and a moving object in the form of a white spot on a dark gray ground, or of a black spot on a white ground. In Fig. 3 is shown the location of the scotoma, the outer line representing its limits when the test was made with a dark object on a white ground, and the inner the limits when a white object on a dark ground was used. The figure is reduced ½ from the scotoma mapped out at 1 *m* distance.

The examination was carried out in reduced daylight with the prevention of lateral dazzling, and fatigue was avoided. The scotoma as represented in Fig. 3 is doubtless larger than it should be on account of the characteristic uncertainty of fixation in the totally color blind, and of their maintenance of steady accommodation.

With a white object the angular diameter of the scotoma was about 2½°. Omitting a marginal zone in which the object sometimes was seen and at other times not, the scotoma might be considered to be 1½–2° in diameter. Uhthoff in his case found a scotoma of 1½°.

Uhthoff, indeed, spoke only of a relative scotoma in his case, implying by "relative" a scotoma in which objects 1 *mm* or less in diameter were not recognized, but larger objects could be seen. Uhthoff's description, however, does not seem to me to preclude the existence of an absolute scotoma. The fact that larger objects were still seen may have been due to the nystagmus, which caused uncertain fixation. In our case there was no marked nystagmus and larger objects were not seen.

Our case differed from Uhthoff's in that the scotomas were not symmetrical in the two eyes, but congruent. In the left eye with its poor vision an accurate determination of the scotoma could not be made. Tests with a movable object of 1 *cm* diameter revealed, however, a scotoma of approximately the same size as that in the other eye, lying like that in the other eye to the right of the point of fixation.

It could not, of course, be proved absolutely that the scotoma was actually a central one corresponding to the fovea, and not a paracentral scotoma, but the position that the eye assumed when the ophthalmoscope was used rendered the former supposition exceedingly probable. When the patient was asked to look directly at the mirror fixation with the right eye was performed, not with the fovea in the normal manner, but with a paracentral portion of the retina including only the temporal margin of the fovea, corresponding accurately to the location of the scotoma in the field.

The question naturally arises whether the presence of a central scotoma might not be due to the ophthalmoscopically visible changes in the fovea and perhaps indirectly to the high myopia, while the congenital color blindness should be regarded as an accidental complication, but for various reasons this seems unlikely. Myopia of 7 D is not often associated with central scotoma, and the pigmented patch in the fundus is about the size of the disc, corresponding to an angle of 6°, while the scotoma has a diameter at the most of 2°. About of the latter size is the central portion of the fovea, which is peculiar both histologically and physiologically in that it lacks rods and visual purple.

It therefore seems to me that the central scotoma is to be considered as being in connection with the disturbance in color perception rather than with the myopia and the central patch of pigment. The former connection has recently been observed in four cases, and the earlier cases in which no scotoma was observed were never carefully examined, and the nystagmus may readily have concealed the existence of a scotoma.

A point of importance is the fact that in almost all cases of total color blindness that have been reported there has been nystagmus either constant or transitory. This is very readily explained if one supposes the function of the fovea to be abolished. Amblyopia of equal degree caused by other conditions does not usually cause nystagmus. Strabismus also is frequently observed. In our case both strabismus and nystagmus existed.

The second subject that we took up in our investigations was in regard to the perception of the Purkinje after-images. Marie Binder, the totally color-blind girl examined by v. Kries, could not perceive these after-images, while Hess's patient did perceive them. The latter must have had extraordinary powers of observation, since on looking at a glowing cigarette that was moved about in a dark room she recognized all six of Hess's phases of the after-image and described them in detail.

We limited ourselves to the actual visibility of the after-image or to the second and third of Hess's phases. After some experiments in regard to the required luminosity Mr. H. actually perceived the after-image. He stated that, following the primary image by a dark interval, he saw a second point, smaller and less bright, which after he had remained some moments in the dark extended out into a lengthening stripe. The distance separating the two images was about an inch, which corresponded closely to my own observation when the rapidity of rotation and the spatial values were the same.

The after-image was seen most clearly when the luminous point was not turned in a circle but was moved backward and forward in a small arc. He noticed that when the movement was stopped or reversed the secondary image passed into the primary and reappeared on the other side.

We used in these experiments the apparatus devised by v. Kries and described by Samajloff. A Welsbach burner was placed in a box and 50 *cm* in front of it was arranged the movable object consisting of a ground-glass disc with two light blue glasses before it. With this apparatus Dr. v. Hippel and myself got a yellow after-image very readily. Mr. H. was more successful when a smoked glass of medium grade was added to the other combination.

As regards the theoretical side of the question, its bearing on the rod theory through the proof of the visibility of after-images by the totally color blind is simpler than it was when v. Kries made his first publication on this point. The patient examined by him did not see after-images, and this

fact was regarded as of great importance for the rod theory.

With our present knowledge it seems most likely that there is a double excitation in the rods. This would explain the double impression gained by momentary excitation in trichromatic, dichromatic, and achromatic eyes and the lack of it in highly hemeralopic eyes. How this double excitation is to be explained is still doubtful.

One unsettled point is that in regard to the response of the retina to momentary excitation with red light, which presents some unexplainable peculiarities which need not be discussed here. Hess's attempt to explain the after-images observed with red excitation on the ground of the theory of complementary colors does not seem justifiable to me.

A CASE OF PHLEGMON OF THE ORBIT AFTER EXTRACTION OF A TOOTH.[1]

By Dr. OTTO HALLAUER.

Translated by Dr. WARD A. HOLDEN from Vol. XXXVII., 3, German Edition, August, 1898.

THE extraction of teeth rarely causes purulent inflammation of the orbital cellular tissues. Feuer, in his paper published in 1892, reviews ten cases. Hirsch, in 1894, was able to collect twenty-five cases. He remarked, however, that in most cases there had been caries of the teeth, and frequently the extraction had led to improvement in the orbital condition, or even to complete recovery from it. Hirsch considers as pure cases only those of Tetzer, Vossius, Burnett, and Fage, adding three observations of his own, in which the extraction of a carious tooth was followed by septic infection and the speedy development of a retrobulbar phlegmon.

Our case is of the same sort.

An Italian mason, twenty-eight years old, had always been healthy, and had good eyes. On February 6, 1896, he had a right upper molar extracted. The following night his sleep was disturbed by severe pain in the right side of the face, and on February 10th, he came to the clinic with an extensive painful swelling of the region of the right orbit.

The right eye could not be opened, the lids were swollen and red, the ball was prominent and rendered the lids tense, and the bulbar conjunctiva was chemotic and injected. The cornea was clear, the anterior chamber and iris normal. The pupil reacted

[1] From Professor Mellinger's clinic at Basle.

sluggishly to light. R V = $\frac{1}{10}$. Ophthalmoscopically the media were clear, the disc was reddened but not swollen, and the veins were dilated.

The left eye was healthy and had normal vision. The region of the right antrum of Highmore was sensitive to pressure, without being swollen. The tongue had a white coating, the breath was offensive, the periosteum at the place from which the tooth had been extracted was painful on pressure. The pulse was 72, full, but weak ; the heart normal.

The patient was admitted to the clinic, and warm fomentations were made in the daytime, and a guttapercha bandage was applied at night. February 11th, a rhinoscopic examination revealed a muco-purulent nasal catarrh, but there was no pus about the middle and superior turbinate.

February 12th, the morning temperature was 38.2°, pulse 60 and irregular. The patient had severe pain in the region of the right eye during the night ; at 2 A.M., therefore, the bandage was removed, and hot fomentations applied, which relieved the pain. The mobility of the ball was slightly diminished outward and inward, and in a more marked way upward and downward. The nasal portion of the upper lid was very prominent, soft to the touch, and less painful on pressure ; chemosis of the bulbar conjunctiva as before ; pupillary reaction normal, and both pupils equal in size. Fomentations and bandaging were continued, cognac was given internally, the mouth was washed with permanganate of potassium, and a lukewarm bath was given. Evening temperature 38.5°.

February 13th, the lids were very red, the conjunctiva chemotic, and the protrusion of the ball was as before. The ball was abducted, pupillary reaction normal, the disc hyperæmic, and there was well-marked pulsation of the retinal veins. Profuse purulent discharge from the nose, the pus proceeding either from the antrum of Highmore or the ethmoidal cells. In either case, a puncture of the antrum seemed indicated.

Morning temperature 38.2°, pulse varying from 52 to 68, the heart sounds dull, the tongue coated, constipation relieved by glycerine suppositories, patient very apathetic.

February 14th, the general condition was improved, the temperature had sunk to 37.8°, the pulse varied between 58 and 62. After gargling, the patient expectorated grayish-yellow purulent masses. The redness of the lids was less marked, the upper lid

was greatly swollen, and fluctuation was detected in its nasal portion; protrusion of the ball and chemosis increased, mobility greatly diminished, pupillary reaction sluggish.

In the evening, the lower turbinates were found to be greatly swollen, and there was considerable purulent discharge. The antrum was opened through the alveolar process, and pus at once escaped. The cavity was tamponed with iodoform gauze, which was removed three hours later on account of pain.

February 15th, the swelling of the lids was much increased, and fluctuation was still evident. An incision 3 *cm* deep was made in the upper lid, from which blood escaped, but no pus. The general condition seemed worse, and there was fever in the evening.

February 16th, the temperature was subfebrile. Many purulent masses were passed from the mouth. The skin of the upper lid was discolored, bluish-red, and the tissues were swollen and hard. The chemotic conjunctiva protruded from between the lids. The pupillary reaction was very sluggish. The supraciliary region and the neighboring regions were very sensitive to pressure, and gave the finger a sense of crepitation.

February 17th, the subjective and the general conditions were considerably improved. Subfebrile temperature still persisted, but the pulse was stronger, more frequent, and more regular. The expression of the face was livelier, though the tongue was still somewhat coated, but the appetite was better. The swelling and sensitiveness of the face were diminished. The eye protruded, and was turned downward and outward. Pupillary reaction good. Disc red, but sharply outlined; veins dilated, arteries moderately full. $V = \frac{8}{200}$.

February 18th, a quantity of offensive pus escaped from the incision made three days before, and a drainage tube was introduced. Pupil narrow, but responsive.

In the next three days the general condition improved greatly, the temperature remained low, the protrusion and impairment of mobility became less, and the pupillary reaction was prompt. The antrum of Highmore was washed out twice daily with 4 % boric-acid solution, through the alveolar opening. The liquid, mixed with offensive pus, escaped from the right nostril. Under this treatment the swelling of the lids and the chemosis rapidly subsided, and the protrusion diminished. The mobility increased, the ball resting in a position of slight abduction. The patient

soon was able to raise the upper lid, and he could count fingers. Pus was still discharged through the nose and mouth.

March 3d., V = $\frac{2}{4}$, crossed diplopia. The upper lid was soft, with a fresh fistula near the old incision. Protrusion of the ball slight; still abduction; slight chemosis. Cornea clear, anterior chamber and iris normal, pupillary reaction prompt, visual field normal, optic disc hyperæmic, but no venous pulsation.

The injections were continued twice daily.

March 10th., the liquid no longer flowed out of the nose, but escaped through the drainage tube in the upper lid, and this continued for a month.

The suppuration gradually diminished, and April 20th it had ceased. The upper lid was still slightly red and swollen, chiefly to the nasal side, where there was still a sensitive spot. The incision was in process of cicatrization. Mobility upward and downward was still slightly diminished. Diplopia could be obtained only with a red glass. R, V = $\frac{1}{2}$ −; L, V = $\frac{2}{3}$; ophthalmoscopic picture normal.

The patient left the clinic without permission in the night, having learned that he was to be arrested for a crime, and no further history was obtained.

Orbital phlegmon may be due to the most manifold causes, and the general etiology had been treated of in detail by Schwendt.

Here I wish to consider only cases of orbital phlegmon that have followed the extraction of a tooth. In our case, the trouble followed the more or less skilful extraction of a painful, carious tooth. With marked disturbances of the general condition, the process extended to the antrum of Highmore and thence to the retrobulbar cellular tissue, threatening the function of the eye and even endangering the life of the patient. The injury to the alveolar periosteum and the exposure of the bone furnished the opportunity for infection. How far the tooth extractor can be held to blame in such cases is questionable. In many of the reported cases, however, both operator and instrument left much to be desired. In Hirsch's first case, a "cattle-dealer" removed the tooth at the fourth attempt; in his second, the operation was an extended one. In Vossius's

case, the village barber held the forceps, and in our case a dresser undertook the operation. That in this case there was no lack of strength on the part of the operator is indicated by the fact that a fairly large piece of the alveolar process came away with the tooth, and since in most of these cases the strength of the operator exceeds his skill, such accidents frequently occur.

The septic material having once been deposited in the region of the exposed alveolar process, it had two ways of extending to the neighboring parts and to the retrobulbar cellular tissues, viz., the lymph or the blood current.

As a lymphangitis (Pagenstecher) or a thrombo-phlebitis (Leber) the process extends directly along the cheek to the periosteum of the orbit, or it passes from the alveolar process through the open communication or through the alveolar venous network to the antrum of Highmore, and thence through veins penetrating the anterior wall of the antrum into the orbit. The pus in the antrum may erode the inferior wall of the orbit, and thus directly break through into the orbit (Fischer). Furthermore, Gurwitsch has shown in his paper on the veins of the face and orbit, that there is a venous network in the periosteum of the anterior surface of the superior maxilla, which enters the vena ophthalmo-facialis, and thus is in connection with the vena ophthalmica, superior and inferior. Finally, Parinaud's investigations have shown that in youth the second teeth are so arranged between the milk teeth and the lower margin of the orbit that a direct communication exists, particularly in the case of the canines and molars. A persistence of these relations appears in adults in a fine vascular channel that from the alveolar process, chiefly near the canines, passes up into the substance of the jaw to the lachrymal sinus and the lower margin of the orbit, and so furnishes a connection between tooth and orbit.

In our case the infective matter passed from the alveolar process into the antrum, and thence through the venous anastomoses into the orbit. In the process the purulent masses rarefied the wall of the nose, and on the sixth day escaped through the right nostril.

In the evening following the extraction there was sufficient pain to prevent sleep, and there were chills indicating the prodromic stage of infection. In the following two days all the symptoms increased. There developed also redness and œdematous swelling of the lids, chemosis of the conjunctiva, marked protrusion and diminished mobility of the ball, and sluggish reaction of the pupil. The pulse became slow and irregular, the temperature became subfebrile, the vision sank very low, and the patient was apathetic. The disease reached its high point on the tenth day.

In the night the pus found its way into the incision in the lid and escaped. With the free discharge through the lid and through the alveolar process, assisted by the irrigations, the threatening symptoms rapidly subsided. Six days later the patient was able to raise the upper lid spontaneously, the vision rose from $\frac{8}{200}$ to $\frac{2}{7}$, and the visual field and the pupillary reaction again became normal. Hyperæmia of the disc persisted, but the venous pulse had ceased. The profuse secretion of pus ceased in the course of five weeks, the vision rose to $\frac{1}{2}$, and the position of the eye again became normal. The patient was not observed further, but it is reasonable to suppose that this satisfactory condition continued.

These affections do not always run so favorable a course. In Hirsch's cases the eyes became blind, once with phthisis bulbi, twice with atrophy of the optic nerve. In Tetzer's case also the phlegmon caused phthisis, in Burnett's there was atrophy of the optic nerve. In Vossius's case, as in ours, the vision returned. In Fage's case the optic nerve remained unaffected throughout the entire course of the disease, but in this respect his case is unique.

If we inquire what were the causes of diminution of vision and blindness in the cases mentioned, we find in Tetzer's case purulent irido-choroiditis without perforation, followed by phthisis bulbi; in Hirsch's second case, thrombo-phlebitis of the choroidal veins, followed by panophthalmitis and perforation with an outcome in phthisis. In Hirsch's first and third cases, and in Burnett's case the eyes outwardly appeared intact, but the optic nerves were atrophic.

In our case, although the vision suffered early and to a

marked degree, the ophthalmoscopic changes were slight, there being only hyperæmia of the disc and venous congestion in the retina. With the escape of the pus the vision rapidly improved. An extensive neuritis then was out of the question, and the diminution of vision must have been due to pressure on the nerve in the orbit from the inflamed cellular tissue.

Taking the histories of those eyes whose sight suffered but which preserved their form, we may divide them into three classes as regards the lesion which caused the diminution of vision. In several there was optic neuritis—demonstrated microscopically a number of times; in others there was interference with conduction from compression of the orbital portion of the nerve; and in others there was disturbance of retinal circulation from compression of the vessels or thrombosis, revealing itself ophthalmoscopically under the picture of embolism or thrombosis of the central vessels.

A few words in regard to prophylaxis and treatment. Careful disinfection of the field of operation and of the instruments used in the extraction is desirable. If a phlegmon has already developed, hot moist applications should be used continuously until fluctuation occurs, when a deep incision should be made. When there is empyema of the antrum, this cavity should be opened and drained.

In conclusion I wish to thank Professor Mellinger for his kindness in allowing me to report this case.

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ON THE ELASTIC TISSUE IN THE HUMAN EYE, WITH REMARKS UPON THE DILATATOR PUPILLÆ MUSCLE.[1]

By Dr. KYOJI KIRIBUCHI, Tokyo.

(*With six figures on Plates VII.–VIII. of Vol. XXXVIII., German Edition.*)

Translated by Dr. Ward A. Holden.

FOR a long time I have had the intention of following up the investigations by Sattler in regard to the elastic fibres of the sclera, by studying the elastic fibres of all the ocular coats. Experiments with orcein and double staining with anilin blue were not successful in revealing the finest fibres, but I had better success with Weigert's method (1898), staining the specimens later with orcein.

Weigert's method is as follows: To prepare the stain, 200 *cc* of 2% aqueous solution of resorcin and 1% fuchsin solution are boiled in a porcelain dish; then 25 *cc* of liquor ferri sesquichlor. ph. G. iii. is added and the boiling continued 2–5 minutes. A precipitate forms, and the liquid after cooling is filtered. The filter paper with the precipitate is boiled in 200 *cc* of 94% alcohol; this is cooled, filtered, alcohol enough added to make 200 *cc*, and 4 *cc* of hydrochloric acid added. The specimen, hardened in alcohol and formol, bichloride of mercury or Müller's fluid, is cut and stained 20–60 minutes in the resorcin-fuchsin solution, then washed in alcohol, cleared in xylol, and mounted. When this is followed by the orcein stain the elastic fibres assume a deep blue or

[1] From the laboratory of the University eye clinic, in Berlin.

violet hue and the background becomes a faint orange-yellow.

The amount of elastic tissue found in individual eyes is subject to considerable variation, as Stutzer has remarked, but it seems to me that the variations depend chiefly upon the age; in the young and particularly in the new-born the elastic fibres are less numerous and finer than in adults.

Cornea and Sclera.—It is still questionable whether the cornea contains elastic fibres or not. Leber at the Heidelberg meeting, in 1896, stated that when he macerated the cornea in sulphuric acid he found fine fibres which he took to be elastic fibres. Sattler on the contrary had been unable to stain any elastic fibres in the cornea. Stutzer in his latest paper says that he could find no elastic fibres in the cornea, withdrawing his former assertion.

It is true that there are no elastic fibres in the middle of the cornea, but in adults at least there are numerous fine elastic fibres taking the stain in the periphery of the cornea. They run with a wavy course among the connective-tissue bundles and for the most part more or less parallel to the bundles. In meridional sections I have found them cut longitudinally, obliquely, and transversely (Plates vii.–viii., Fig. 1, a, a). They are not so thick as the elastic fibres in the sclera, and their number decreases toward the centre of the cornea, they never extend more than 2–3 *mm* from the corneal margin.

The membrane of Descemet stains like the elastic fibres and passes over into the elastic fibres of the chamber angle (Plates vii.–viii., Fig. 3, f).

At the spot where the bulbar conjunctiva is attached to the cornea, there are found in the conjunctiva numerous branched and wavy elastic fibres which in meridional sections appear cut longitudinally, obliquely, and transversely.

As regards the sclera, I can confirm Sattler's statements. The parenchyma is fairly rich in elastic fibres which are fine but somewhat thicker than those of the cornea. They run parallel with the connective-tissue fibres and are not very wavy. The inner layer of the sclera is richer than the outer. In the anterior portion of the sclera the elastic fibres increase

greatly in number in the inner layers (Fig. 3, c), and become very numerous in the region of the insertion of the ciliary body and iris and about Schlemm's canal. Here the fibres are very thick and run in a more circular direction (Fig. 3, b, b), so that in meridional sections they appear cut transversely. From these circular fibres longitudinal fibres pass backward in increasing number (Fig. 3, d), but decrease toward the cornea, and finally pass over into the membrane of Descemet or extend a short distance into the parenchyma of the cornea anterior to the membrane (Fig. 3, e). In the episcleral tissue and where the sclera and choroid join, elastic fibres are very numerous, and they are numerous also at the insertions of the muscles and tendons.

Posteriorly in the region of the porus opticus fibres cut longitudinally are rare in transverse sections. In flat sections of the sclera through the optic nerve, at the level of the lamina cribrosa, one sees a ring of elastic fibres close together, parallel and but slightly wavy (Plate vii.–viii., Fig. 2, b). The elastic fibres of the sclera here, which for the most part are cut longitudinally, are interwoven and strengthen this ring, in part passing into it (Fig. 2, c, c), in part passing by it (Fig. 2, d), and in part passing directly through it into the elastic tracts of the lamina cribrosa (Fig. 2, f). These tracts receive their fibres from the elastic ring, and they interlace and cross one another, passing to the common elastic sheath about the central vessels (Fig. 2, e). In adults, the lamina cribrosa has the appearance of consisting entirely of elastic tissue (Fig. 2, a), while this is not the case in the new-born, although here the scleral ring is well indicated. I have not found elastic fibres in the nerve anterior to the lamina cribrosa except in the sheaths of the vessels.

In glaucomatous excavations, the floor of the excavation is formed of a layer of compressed elastic fibres (Fig. 4, a), behind which proliferated connective-tissue is seen.

In the posterior portion of the lamina cribrosa, I have often seen elastic fibres extending backward, first obliquely and then directly back among the nerve fibres. In the trunk of the optic nerve, the elastic fibres diminish in number

from the posterior surface of the lamina cribrosa to the optic foramen. Here they increase again and then become less toward the chiasm.

In the dural vascular sheath and the subarachnoid tracts, my preparations exhibited elastic fibres as Sattler described them.

Iris, Ciliary Body, and Choroid.—The pigmented iris is hard to study, hence I bleached my preparations according to Alfieri's method, then used iron-alum solution as a mordant, and subsequently stained according to Weigert's method.

Contrary to my expectations, I found the parenchyma of the iris poor in elastic fibres, only a few circular fibres appearing at the root of the iris (Fig. 3, h), and in some preparations a few fibres among the fibres of the sphincter muscle. However, there were many elastic fibres in the vessel-walls, extending even to the capillaries.

The limiting membrane which lies in front of the pigment epithelium stained dull blue by this method like the sphincter muscle of the pupil, while the so-called elastic membranes, such as Descemet's membrane and the hyaloid membrane on the choroid, stained more deeply than the elastic fibres. Since this stain is a selective one, the limiting membrane of the iris must be of other nature than the elastic membranes. According to Henle, Merkel, Luschka, Jeropheeff, and others, this limiting membrane is composed of unstriped muscle fibres, while their opponents, Grünhagen, Hampeln, Schwalbe, Michel, Kaganei, and Fuchs, regard it either as a structurely vitreous membrane of elastic consistency or as standing between elastic fibres and connective tissue. According to my investigations, the limiting membrane is not an elastic membrane; but the posterior surface of the iris is more elastic than the anterior, and since the limiting membrane is not thrown into folds when the pupil dilates, it must possess a certain elasticity. Furthermore, since extreme dilatation of the pupil cannot be explained as being due to simple vascular contraction, and since no other structure than the limiting membrane exists which could produce dilatation of the pupil, this membrane if not elastic must be muscular. In bleached preparations stained by

Van Gieson's method or with 3% hematoxylin, I found a layer of spindle cells with elongated nuclei (Fig. 5, d), just as Grunert has recently described them. I believe, therefore, that a dilatator muscle exists in the human iris.

In the ciliary body, the elastic fibres are fairly numerous and their arrangement is very characteristic. The chief group is that which from the inner wall of Schlemm's canal spreads out fan-shaped in from five to nine bundles between the muscular fibres of the ciliary body (Fig. 3, g). In the new-born, these bundles are very poorly developed. The bundles here branch and anastomose with neighboring bundles, and the fibres are wavy, running mostly in a radiating direction, although some run circularly. The most anterior bundle (Fig. 3, g′) usually runs backward almost parallel to the sclera and passes over into the elastic fibres of the choroid. The most posterior bundle (Fig. 3, g″), which is particularly rich in circular fibres, runs between the root of the iris and the ciliary body, bounding the chamber angle anteriorly and laterally. As a portion of the latter are to be regarded the circular fibres in the root of the iris (Fig. 3, h). Another portion extends farther backward into one, two, or even three ciliary processes. Other groups of this bundle usually end in their course between the muscle fibres. In well developed cases, some of the most posterior bundles anastomose before the ciliary processes with fibres which run meridionally forward from the network of elastic fibres in the choroid, bordering the ciliary muscle to the inner side and here breaking up into fine interlacing twigs (Fig. 3, i).

The choroid also is rich in elastic fibres. The lamina vitrea, which lies beneath the layer of retinal pigment epithelium, stains deeply and consists of elastic fibres (Fig. 6, b). In the layers of large and medium-sized vessels, many thick elastic fibres run parallel with the vessels, partly in the sheaths of the vessels, partly in the spaces between them (Fig. 6, c). The suprachoroidal tissue also is rich in elastic fibres, which were cut longitudinally, transversely, or obliquely (Fig. 6, d).

Posteriorly the fibres of the lamina vitrea and of the vascular layers unite and pass into the choroidal ring, which is

usually well developed, where the elastic fibres run parallel and close together, surrounding the optic-nerve entrance. This elastic ring is sharply limited within, and no fibres pass from it into the nerve except such as follow the sheaths of the vessels. The vessels penetrate this ring and enter the optic nerve, where they communicate with the capillary network of the nerve. The elastic ring of the choroid is less pronounced anteriorly, but posteriorly it is better developed and passes into the scleral ring. My thanks are due to Professor Greeff for the friendly interest he has taken in my work.

EXPLANATION OF THE FIGURES OF PLATES VII.–VIII.

Fig. 1.—Meridional section of the cornea. Weigert stain and orange. Leitz $\frac{1}{12}$. Oc. I.

a, a, elastic fibres; b, corneal corpuscles.

Fig. 2.—Transverse section of nerve at level of lamina cribrosa. Weigert, obj. 3, oc. I.

a, elastic fibres in lamina cribrosa.

b, elastic scleral ring.

c, c, elastic fibres in sclera, passing over into elastic ring.

d, elastic fibres running by the ring.

e, elastic fibres in the sheath of the central vessels.

f, elastic fibres passing transversely through the ring.

Fig. 3.—Radial section through the ciliary body, canal of Schlemm, and iris. Obj. 3, oc. III.

a, canal of Schlemm.

b, circular fibres in its walls.

c, fibres in the inner layers of the sclera.

d, meridional fibres in front of canal of Schlemm.

e, elastic fibres passing into Descemet's membrane.

f, Descemet's membrane.

g, fan-shaped fibres in the ciliary muscle; g′, anterior, g″, posterior bundle.

h, circular fibres in the root of the iris.

i, tracts of fibres which run directly before the ciliary processes and border the ciliary muscle internally.

j, 1 and 2 ciliary process.

Fig. 4.—Longitudinal section of nerve-head excavated from glaucoma.

a, compressed elastic fibres.

b, atrophic nerve fibres.

c, choroid.

r, retina.

s, sclera.

Fig. 5.—Radial section through the posterior layer of the iris with medium-wide pupil. Obj. $\frac{1}{12}$, oc. I.

a, bleached posterior pigment epithelium.

d, dilatator pupillæ muscle.

e, stroma of iris.

Fig. 6.—Meridional section of choroid. Obj. 6, oc. I.

a, retinal pigment epithelium.

b, hyaloid membrane.

c, elastic fibres in and among the vascular sheaths of the middle-sized and large vascular layers.

d, elastic fibres in the suprachoroidal layers.

e, sclera.

REPORT OF A CASE OF STAB WOUND IN THE OCCIPITAL REGION, FOLLOWED BY HOMONYMOUS HEMIOPIA.

By HARRY FRIEDENWALD, A.B., M.D., Baltimore, Md.

(*With a chart of the fields of vision.*)

THERE are few cases recorded, in which injury to the occipital lobe produced hemiopia.[1] This alone would be sufficient reason for publishing the following case — which, however, is interesting in several ways.

History.—Wesley M., aged about thirty, was admitted on March 6, 1901, to the City Hospital. Barring the diseases of childhood and typhoid fever a few years previously, he had always enjoyed good health. His family history was likewise good and he denied lues. He was married, and worked on railroads in Virginia. One year ago, while superintending a gang of Italians, one of the latter stabbed him in the back of the head with a large pocket knife. The patient fell to the ground but was not unconscious. He felt the knife in the back of the head and

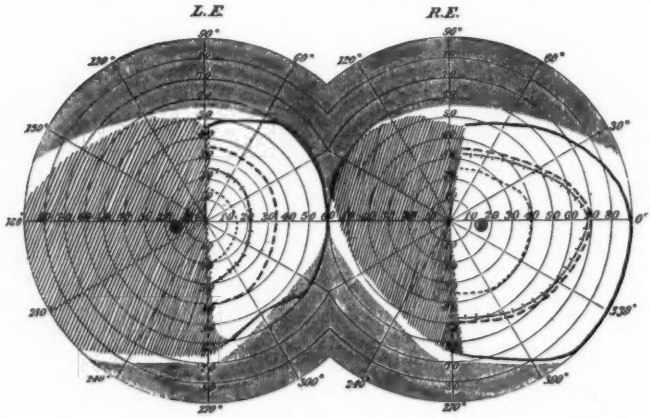
[1] Keen and Thomson, "Gunshot-Wound of the Brain, Followed by Fungus Cerebri, and Recovery with Hemiopia," *Transactions of the American Ophthalmological Society*, 1871, p. 122; Phillips, "Right Lateral Hemianopsia after Injury," *Ophthalmic Hospital Reports*, 1899, vol. xii., p. 332; H. Schmidt-Rimpler. "Cortical Hemianopsia with Secondary Degeneration of the Optic Nerve," Arch. of Ophthal., 1890, vol. xix., p. 147; also *Bericht. Ophthal. Gesells.*, 1883, p. 5; H. Schmidt-Rimpler, "Bilateral Hemianopsia with Autopsy," *ibid.*, 1893, vol. xxii., p. 313; Nieden, "Ein Fall von einseitiger temporaler Hemianopsie des rechten Auges nach Trepanation des linken Hinterhauptbeines," *Arch. f. Ophthal.*, vol. xxix., p. 143; Faravelli, "Emianopsia omonima destra d'origine traumatic," *Arch. d'ottalmologia*, xx., S. 431, 1891; Peters, "Hemianopsia nach Schaedelfractur," *Deutsche medic. Wochenschr.*, 1891, Nr. 38; Gelpke, "Zur Casuistik der einseitigen homonymen Hemianopsie corticalen Ursprungs, mit eigenartigen Störungen in den sehenden Gesichtsfeldhälften," *Arch. f. Augenheilk.*, vol. xxxix., p. 116, 1899.

pulled it out, in doing which he states he bent the blade. He maintains that he was blind from the moment he was struck, but that he was able to mount his horse that was standing beside him and that the horse led him to the camp, eight miles distant. There he was able to call to his friends to send for a certain doctor (preferring him to another), and then became unconscious and remained so between two and three weeks. When he recovered consciousness, he observed that his vision was defective. This has not changed since that time. The wound required two months to heal.

The only other symptom due to the injury to the brain was recurrent epileptiform convulsions, which came on about once a month, or still less frequently, and which first appeared six months after the attack.

Present condition.—The patient is a man in apparent health and of good intelligence. He pointed out the spot on the occipital bone where the knife had entered, and here we found a small linear scar and some irregularity of the surface of the bone. Pressure upon this point gave him a feeling of nausea.

His central vision was normal in both eyes and he was able to read large and small print with ease. The field of vision was that of typical homonymous hemiopia, the line of separation being vertical as tested on the perimeter. (See perimetric chart.) The



left halves are entirely abolished and he is not able to see even a bright candle-light held close to the face on this side. The right

halves are perfectly normal for form and color. In order to mark out sharply the line of separation of the blind and seeing halves of the fields, the patient is tested on a black-board with a small test object at one metre's distance. It is found that the line is not perfectly vertical, but recedes somewhat toward the seeing side both above and below, and is almost identical for both eyes.

The line of separation passes very close to the point of fixation. By a method suggested by me elsewhere, I measure this to be about one sixth of one degree for each eye.

The movements of the eyeballs and the pupillary reflexes are likewise perfectly normal, responding equally when light is thrown from either side. The fundi oculorum are normal.

He complains of frequent headaches and of "sickness at the stomach and fainting spells," which are epileptiform seizures. Before these attacks come on, he becomes perfectly blind and sees red, blue, and black spots, and images of persons appear before him just before he loses consciousness. He states that he does not see anything on the blind side excepting flashes of light.

The knife with which the injury was done was examined and found to be 18.5 *cm* long, including the handle. The blade itself measured 7.5 *cm* and 2 *cm*, from the point it was sharply bent over on itself, which bend the patient assured us represented the extent to which the knife had entered the skull; it was due either to the deflected force of the knife in entering, or in the awkward attempt to remove it. The blade came to a sharp point and was one centimetre wide at the bend just mentioned. The point, therefore, which entered the skull was represented by a triangle 2 *cm* in height and 1 *cm* at the base. Making a fair allowance, it is probable that the knife entered the brain tissue to an extent not exceeding 1.5 *cm*.

Having in view a possible depressed inner plate of the occipital bone, or an exostosis pressing upon the brain tissue, the patient was referred to Dr. J. W. Chambers for operation, and on March 13th the **operation** was performed. During the anæsthesia the patient had an epileptic convulsion. After the head had been shaved, the small linear scar was distinctly visible, and corresponded as nearly as we could make out to the middle occipital lobe within 1 *cm* of the median line. A horse-shoe flap was made around the region of the original wound. Coming down to the bone, the point of the entrance of the knife blade could be seen,

but the depression which had been felt and believed to be the site of the injury was found to be the normal surface depression. A circular opening was made through the skull with chisel and bone forceps. The bone wound was perfectly smooth within as well as on the surface. A small scar was found in the dura, which was weakened at this point. There was no spicule of bone pressing upon the meninges, but there was adhesion between the dura and the pia mater. A small smooth cicatrix was felt in the surface of the brain by the surgeon, but no gross injury was found, and the surgeon deemed it best not to excise this. The wound was closed with subcutaneous silkworm-gut suture, and a small iodoform gauze drain left in at one angle of the incision.

In the evening about four or five hours after the operation, the patient was found resting very quietly without pain.

On *March 17th*, the wound was dressed and the drain removed. Excepting at the latter point, the wound had healed by the first intention and the sutures were removed.

March 19th, the patient sat up for two hours and he has been feeling very well.

March 22d, the patient had an epileptic convulsion at 1:30 P.M. He states that he felt the attack coming on,—felt giddy and saw blue spots before his eyes; he had time to lie down on the bed before it began. During the time he was completely unconscious. He had twitchings and contractions of the muscles of the extremities and of the face; he did not, however, bite the tongue; there was some foaming and frothing at the mouth. The eyes were turned upwards and to the left (blind) side. The pupils were moderately dilated. He remained unconscious for several minutes and, after recovering, his mind was cloudy for some time. Two or three hours later he was feeling fairly well but for a slight frontal headache.

March 25th, the wound was found completely healed, leaving only a narrow scar which was dressed with collodium. During his recovery, the temperature at no time rose, excepting on March 16th (three days after the operation) when it reached 100° in the evening. It was otherwise normal throughout the recovery.

The patient was observed until April 4th, when he left the hospital without permission. During this time the fields were again carefully examined (March 29th).

The hemiopia was practically the same; the lines of separation between the seeing and the blind halves appeared to have receded

a little in favor of the seeing side. The change was entirely in the upper half of the field, the lines below corresponding exactly with those taken before the operation. In the upper halves the difference is between six and eight degrees. The relation of this line to the point of fixation was likewise retested after the operation and found to be exactly as it was before, the line passing about one sixth of one degree from this point.[1]

REMARKS.

It is not a simple matter to explain the absolute hemiopia resulting from an injury of relatively so small an area. And the difficulty increases if we accept the modern view that the visual centre does not lie in the external cortex of the occipital lobes but entirely on the mesial surface, in the cuneus and lingual lobe (Flechsig), or perhaps even limited to the area about the calcarine fissure (Henschen).

The position and the extent of the direct injury being insufficient explanation for the visual defect, we are led to inquire whether hemorrhage offers a more satisfactory hypothesis. It must be admitted that a hemorrhage of sufficient amount in this part of the occipital lobe may injure the optic radiations beyond recovery. If we furthermore remember that the patient did not become unconscious immediately after the injury, but was able to ride a distance of eight miles before unconsciousness set in, and that this lasted from two to three weeks, we find that this view has firm support.

The case presented none of the cerebral symptoms which have been observed accompanying cortical or sub-cortical hemiopia, such as mind-blindness, amnesic color-blindness, visual hallucinations, etc. The only other symptom of cerebral disease was epileptiform convulsions. These have been observed in a few other cases. Wilbrand[2] found epileptiform convulsions mentioned in six cases out of a total of 154.

[1] The patient was heard from by letter February 22, 1902. The half-blindness was unchanged and he had had five convulsive seizures in the past eleven months. Visions still precede the convulsions, "appearing before the blind side, where it all seems to start. The blind side becomes blue-gray, then like the flash of a match blaze just before the convulsion begins." He appears to be much amazed because "while working, stooping over, or lifting something, the blind side will, like a flash, turn blue or perhaps a little gray, so that he has to close the eyes and lie down."

[2] *Ueber Hemianopsie*, Berlin, 1881, p. 169.

It is interesting to note that visual hallucinations preceded the attacks in the case reported above.

Concerning the line of separation between the seeing and the blind halves, we may state that the examinations were made with great accuracy and frequent repetition. The slight differences between the lines before and after operation may, it is true, be accounted for by slight movements of the head; to the examiner, however, the differences appeared real and not due to error.

The relation of the line of separation to the point of fixation was measured by the method suggested by me in these ARCHIVES,[1] a method which yields great accuracy.

[1] Vol. xxix., p. 294.

ON THE SIMULTANEOUS OCCURRENCE OF CHANGES IN THE RETINA AND CHOROID.

By Dr. JOSEF HAAS, Vienna.

(*With two illustrations in the text.*)

Translated by Dr. Ward A. Holden.

THE retina is dependent upon the choroid for its nutrition, and hence it is easy to understand why changes should occur in the retina when the choroid becomes inflamed or atrophied. On the other hand, the choroid frequently becomes inflamed *ex contiguitate* when an inflammation has developed in the retina.

The case to be described is interesting, since here a choroidal and a retinal affection were found to exist at the same time, although separated, the retinal affection being at the macula and the choroidal in the periphery. The cause of the two affections was doubtless identical and to be sought for in a hereditary degeneration.

T. A. is the fifth of thirteen children. Two older and two younger died from infectious diseases. A brother of his father's and one of the sons are myopic in high degree. The parents of the patient have good vision, and so have the other children of the family, excepting one, whose history is added below. There is consanguinity, as the grandfather of the father and the grandfather of the mother were brothers. No case of cretinism or insanity is known in the family.

The patient states that at the age of seven his vision was as bad

as it is at present. He does not remember having had any diseases in infancy.

Status præsens.—Nothing abnormal was found about the body. The eyes externally appeared normal. Media clear. Pupils responsive.

Ophthalmoscopic examination, right: Disc of normal appearance, with a small physiological excavation and sharp outline. Arteries and veins normal. In the macular region (as shown in Fig. 1, which Dr. Salzmann had the kindness to draw for me) there is a peculiar radiating figure, consisting of whitish spots and stripes. About the fovea these form an almost complete ring

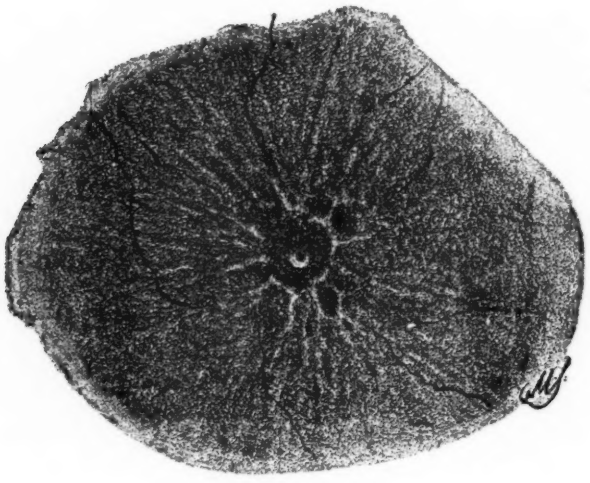


FIG. 1.

one-third p. d. in diameter. Where the radiating stripes join the ring, there are little elevations of a delicate whitish color. Not all of the stripes join the ring. These are most pronounced downward and inward from the macula, and here anastomoses are more numerous. No parallactic displacement of these figures could be obtained, although the retinal reflexes changed as the ophthalmoscope was turned. The pigment epithelium in the macular region is delicately granular; the remainder of the fundus presents indistinct patches of pigmentation, more marked in the

periphery. The choroid with its patches of stroma pigment ends abruptly in a sharp line in the upper periphery of the fundus. This line consists of little curves combining to make up larger ones. Beyond this line the choroid is atrophic, and in its place one sees the white sclera on which small masses of pigment still lie (Fig. 2). The choroid is atrophic in the outer periphery also, but the transition is not so sharp as in the upper periphery. Elsewhere no choroidal atrophy can be found. When the pupil is small, one sees, besides the figures described in the macula, many of the ordinary reflexes and a crescentic reflex in the fovea.

Left eye: Disc normal. In the macular region are stripes radiating from a central ring, as in the other eye. In the periphery of the fundus, above, outward, and below, are choroidal

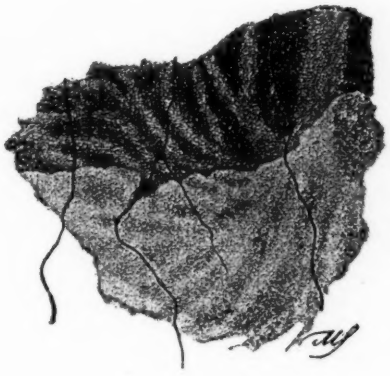


FIG. 2.

changes similar to those found in the other eye, but more extensive. Downward and inward there is a black pigment spot in the retina.

The limits of the visual field, tested with a white object 10 *mm* square, are:

Right eye: Upward 22°, outward 25°, downward 20°, inward 25°.

Left eye: the limits are somewhat larger.

No scotomata in either field.

Right eye, V = $\frac{6}{60}$; with + 1.5 D $\frac{6}{6}$. Jaeger No. 6 at 17–20 *cm.*

Left eye, V = $\frac{6}{60}$; with + 1.D $\frac{6}{60}$. Jaeger No. 6 at 14–24 *cm.*

We had to do here with a case of peripheric atrophy of the choroid in a patient of consanguineous parentage. Further than this, there were delicate changes at the macula. Similar choroidal changes and signs of a preceding neuro-retinitis were found in the eyes of the patient's brother by Professor Dimmer in Innsbruck, to whom I am indebted for the following report.

It seems likely that the retinal changes in our case were due to a neuro-retinitis in childhood, which left no signs in the disc, but permanent changes in the retina. A preceding neuro-retinitis would explain the functional changes which were found; and no symptoms were present which occur with the different varieties of retinitis pigmentosa.

G. T., aged fourteen, a brother of the other patient. Had pneumonia in early youth, and was always sickly. Four years ago he had scarlatina. His vision has been poor since birth, but he knows of no cause for this.

Status præsens.—A well built boy with healthy teeth. The skull unusually high. Both eyes normal externally.

Ophthalmoscopic examination: L. disc pale, sharply limited outward, but with a blurred inner margin. Paler in the outer than in the inner half. The retinal vessels are normal. In the macular region there is seen, but only with the concave mirror, a delicate whitish mottling. The fundus is light. In the lower-outer portion of the periphery there are some large, pale, yellowish-red, indistinctly limited patches.

In the right eye the discoloration of the disc is more marked, and the inner margin can scarcely be made out. The outer half is pale, the inner of a dirty gray appearance. There is an irregular heaping up of black pigment at the outer margin of the disc. In the macular region can be seen, even with the plain mirror, very delicate, whitish, radiating stripes, which do not change their position when the mirror is moved. The retinal vessels are of fairly normal appearance, the arteries perhaps thinner than usual. In the periphery is a small black patch, and the periphery of the fundus is slightly mottled.

Limits of the field of vision for a white object 10 *mm* square on the right side, concentric contraction of 10–20°; on the left side similar contraction, except inward and downward.

R V $\frac{6}{60}$; with + 1. D $\frac{6}{24}$.

L V $\frac{6}{24}$; not improved.

THE TREATMENT OF CORNEAL ULCERATONS WITH SUBCONJUNCTIVAL INJECTIONS— THEIR VALUE.

By Dr. JOHN DUNN, Richmond, Va.

AFTER having made use of subconjunctival injections in the treatment of corneal ulcerations for several years, I have become convinced that this mode of treatment has a value altogether its own, one which is possessed in the same degree, in appropriate cases, by no other therapeutic resource at our command, and the object of this paper is to point out, as briefly as possible, wherein consists this peculiar value and what seem to be the indications for their use, reporting, by way of illustration, three cases in which they were resorted to.

The FIRST CASE is that of Mr. A., aged thirty, whose cornea had received, just over the pupillary area, a scratch, several days before he came for treatment. When first seen there was over the pupil a deeply ulcerated spot about 3 *mm* in diameter, from which externally there was an abundant purulent discharge. The adjacent cornea and the membrane of Descemet were cloudy. A large hypopyon was visible in the lower part of the anterior chamber. *The conjunctiva was only moderately congested*—the discharge from its surface being slight. An injection of a solution of cyanide of mercury (1:3000) was given. Sterilized atropia salve every three hours was ordered and hot applications. The following day the surface of the ulcer was clean and free from any external secretion. *No conjunctival discharge.* The membrane of Descemet and the cornea had cleared markedly. The hypopyon had decreased in size. The infection was no longer spreading. The atropia salve and hot applications were con-

tinued. On the third day the hypopyon had disappeared, and the cornea was well save for the filling in of the ulceration, which took place normally, leaving at the end of a week only a slight corneal change.

The SECOND CASE was that of Mr. J., aged twenty-five, who consulted me, January 7, 1901, in regard to his left eye, which for several days had been giving him trouble. Examination revealed an acute inflammation of the Meibomian glands. The lids, the seat of an old blepharitis, were swollen, and from the mouths of the Meibomian ducts of the lower lids exuded a profuse whitish discharge. The conjunctiva was injected. Occupying the lower $\frac{1}{3}$ of the corneal margin for the width of 1 or $1\frac{1}{2}$ *mm* was an ulcer, whose surface looked as though it had been white-washed with a miniature brush. The photophobia was intense. I had been reading articles on the use of the tincture of iodine in corneal ulcerations, and hoping to share the enthusiasm of their writers, I determined to give it a trial. I accordingly rubbed off the whitish deposit and freely applied, three or four times, the tincture of iodine to the ulcerated surface — the burning caused intense pain for two or three hours. Atropia and yellow oxide salves were ordered for the eye and for the lids. The following day I found that the ulcer had spread so as now to occupy the whole inner half of the corneal margin for a width of 1 to $1\frac{1}{2}$ *mm*, being widest and deepest over the area burnt the day previously. I again applied the iodine thoroughly. On this occasion I expressed with much care the contents of the Meibomian ducts. On January 9th — *i. e.*, the next day — the ulcer had now spread so as to involve the whole of the corneal margin save about 5 *mm* at the top. It was also spreading deeper and deeper into the cornea and becoming wider. Iodine was again applied. On January 10th and 11th the ulcer, although the lids were better, was found to have increased farther in depth. Each day I again rubbed the surface of the ulcer and applied iodine. The conjunctival congestion was now intense and the patient was suffering greatly and constantly. The next day, January 12th, I came to the conclusion that iodine was in this case worse than useless. It had no demonstrable effect in lessening the progress of the ulcer and its application proved little less than torture. The ulcer was still spreading, chiefly into the depth of the cornea. I now had recourse to the actual cautery. Without going further into the history of the case, I will merely add that I have never known a case

to suffer as intensely and as long from corneal ulceration, which finally recovered without a scar and with normal vision. Mr. J. was in a dark room for six weeks, and his recovery at all was due to repeated use of the actual cautery, the only thing that seemed in any way to check the progess of the ulcer.

In March, 1902, Mr. J. returned to say he was having trouble with the *right eye.* I found present a slight conjunctivitis with a faint cloudy spot on the margin of the cornea. There was present a slight blepharitis, nothing like so severe, however, as the year before. I ordered a boric-acid salve and a zinc chloride and a boric-acid eye-wash, to be applied frequently. Mr. J. returned after a few days with the remark that he feared a repetition of the trouble he had had the year before. Examination of the eye revealed a marginal ulceration, 1 to 1½ *mm* broad, occupying the inner ¼ of the corneal margin. It showed the same whitewashed appearance seen in the other eye the year previous. A full subconjunctival injection of iodine—iodide of potash—solution was given. The patient was put to bed and the boric-acid–zinc-chloride treatment continued. The following day the whitewashed appearance of the ulcer was gone, and in four days the eye was well.

The LAST CASE is that of Mr. K., aged thirty-two, who a week before he came under my care had "gotten something in" his left eye. Examination revealed in the outer-lower quadrant of the cornea an ulcerated surface about 4 *mm* in diameter. It was covered with secretion. Cloudy streaks could be seen extending throughout the corneal substance in all directions. The conjunctiva was slightly congested and the source of some discharge. A full subconjunctival injection of the iodine—iodide of potash—solution was given. The following day all secretion from the ulcer had ceased, and it could be seen that the corneal ulceration was no longer spreading and had assumed a healthy appearance; owing, however, to its size, depth, and its irregular surface, the ulcer required considerable after-treatment before it finally healed over.

Let us look for a moment at these three cases. In none of them was there present either a severe congestion or marked inflammation of the conjunctiva, and yet we must admit that in each case the conjunctival sac contained many of the micro-organisms to initiate the corneal ulceration.

These micro-organisms were, however, in all three cases sufficient to increase the conjunctival secretion and to cause a *catarrhal discharge. This disappeared in each case entirely and finally within a few hours after the subconjunctival injection was given.* Thenceforth during the treatment the discharge from the conjunctiva was watery. This absence of discharge other than lachrymal after the use of the subconjunctival injection is a markedly noticeable feature of the subsequent history. This being the case, we may infer that the result of the injection is *to render and keep sterile the conjunctival sac*, an important step in the proper treatment of corneal ulcerations, because the corneal abraded surface, no matter how carefully disinfected, whether by the curette or the actual cautery or caustics, such as iodine, carbolic acid, etc., may reinfect itself within a few hours where the conjunctival surface is left infected. In our first case the location, size, and depth of the corneal ulcer made recourse to actual cautery highly undesirable. Curettement and the application of iodine would have required a stronger faith in their curative powers than I possessed; and besides, the application of iodine to a corneal ulcer not only has no curative effect on the concomitant conjunctival condition, but so increases the congestion as to render the irritation or inflammation the more intense, and so the liability of the corneal ulcer to reinfection all the greater. The second case at first glance is a striking illustration of the advantage of the subconjunctival method over the treatment by iodine and supraconjunctival applications. The illustration is, however, not so decisive as it seems, for the blepharitis was much more intense during the early stages of the ulcer in the left eye than in the right. There is, however, little reason to believe that the use of iodine on the ulcer of the right eye would have cured it in the presence of an infected lid and conjunctiva; and there are many reasons to think its use would have served only to increase the spread of the ulceration, in that it would have further congested and inflamed the conjunctiva. It may be asked why I did not use a subconjunctival injection in the left eye as soon as I found that the iodine was not bringing about the desired result. It

was because by the time I came to the conclusion that iodine applications had proved a failure, the bulbar conjunctiva was so intensely inflamed and the ulcer so extensive and deep that the free corneo-conjunctival circulation was greatly interfered with. This point will be referred to later. Our third case is the most striking example of the three of the special value of subconjunctival injections. Here we had to do with an irregularly ulcerated surface of the diameter of a small garden pea, from which in all directions cloudy streaks spread into the corneal substance, and from whose surface an abundant secretion was coming, and to this was added a mild catarrhal conjunctivitis. One of the rules suggested for the use of the actual cautery is that it burned all the clouded area. In this case one half of the corneal surface would have required burning. For reasons given above, I think little good could have been expected from the iodine applications. From no treatment other than the subconjunctival one could we have hoped to be able to say in eighteen hours: "This ulcer is no longer progressing; the healing process has begun." This case, as well as case No. 1, seems to show that the corneal substance, as well as the conjunctival surface, is sterilized by the fluid of the subconjunctival injection. This fluid must, to accomplish this, be carried by the lymph channels throughout the corneal substance and in sufficient quantities to destroy germ life and to prevent its further development. The injection furnishes a subconjunctival reservoir of antiseptic fluid which slowly and continuously, for several days, empties itself into the corneal substance, and its value seems to be largely dependent upon the freedom of the corneo-conjunctival circulation. We are to expect the best results from subconjunctival injections in those cases where the corneal ulceration exists in the presence of a relatively healthy condition of the conjunctiva. No claim is here made that the subconjunctival method will cure every corneal ulceration. The general condition of the conjunctiva, the stage which the ulceration has reached, and the general condition of the patient may render its use inadvisable. Whether it would have any beneficial effect in mycotic ulceration is doubtful. In phlyc-

tenular ulceration I have never tried it. Nor have I tried it, save once, in ulcer complicated by purulent conjunctivitis, and here it failed to arrest the destruction in an ulceration, which, however, was already far advanced.

As a subconjunctival injection for corneal ulceration, I have used only two of the many preparations suggested by different writers: the cyanide of mercury solution, 1:3000; and iodine — iodide of potash — solution: metallic iodine, gr. $\frac{1}{5}$; iodide of potash, gr. xv; distilled water, ʒi. These I have used, first one and then the other. My preference, however, is for the iodine solution.

There are two objections to the use of these injections, and the first is that they are for a short while extremely painful, so much so that for slight corneal ulcerations the supraconjunctival method of treatment is preferable. The pain, however, lasts only a short while, and from what my patients say it is fair to infer that at the end of half an hour the pain is much less than that caused by the application of iodine. The other objection is one the importance of which I have not been able to decide. Apparently more or less inflammatory adhesion of the conjunctiva and subconjunctival tissues takes place as the result of the injection. This is often visible a long time after the injection has been given. I have seen no demonstrable harm result from it. The fluid injected beneath the conjunctiva is very slowly removed and in many cases is to some extent plainly visible several days after the injection has been made. These objections are trivial in comparison with the object to be gained — the healing of the ulcer. After the subconjunctival injection has been given, the use of atropia, of boric acid or aristol salve, and of hot applications is to be advised. In the treatment of corneal ulcerations the frequent use of some salve is of great service, the grease lessening in a great measure the ill effects of the roughness of the conjunctiva of the upper lid as it rubs over the ulcer; this roughness, the result of congestion, is very commonly found accompanying ulcers of the cornea which have been either neglected or improperly treated. White vaseline and boric acid (ʒ ss – gr. xii.), to be hourly applied, serves our purpose well.

The atropia, too, may be applied twice daily in the form of a salve. For the resulting opacities and in cases in which the repairing of the ulcer is slow eserine is to be advised.

The frequency of the hot applications will depend upon the case. As to the method used: the conjunctiva, after having been cocainized, is picked up with a pair of mouse-toothed forceps about 1 *cm* from the corneal margin, opposite the ulcer. Ten or twelve drops of the solution are then injected from any ordinary hypodermic syringe without removing the point.

REPORTS OF MEETINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

THURSDAY, JANUARY 30, 1902.

DAVID LITTLE, M.D., F.R.C.S.E., PRESIDENT, IN THE CHAIR.

Dr. C. O. Hawthorne read a paper on **intracranial thrombosis as a cause of double optic neuritis in cases of chlorosis.**

In cases of chlorosis it is not unfrequently found that there is double optic neuritis, and this is sometimes accompanied by paralysis of one or other of the ocular nerves. In these cases there is generally thrombosis of some of the intracranial veins.

We know how frequently intracranial growths produce optic neuritis, and we may look upon a thrombosed sinus as really playing the part of a tumor in the production both of this and also of ocular paralysis. In disease of the middle ear, not only does optic neuritis frequently follow thrombosis, but clearing out the sinus generally leads to the subsidence of the neuritis. Cases of all degrees of severity are met with in chlorosis. In some there is paralysis, optic neuritis, and thrombosis, and as these severe cases sometimes die, post-mortem evidence is available. In less severe cases there is simply neuritis apparent, but the author thought that these also had some thrombosis, and this would account for all the symptoms which are otherwise extremely difficult to interpret. He cited several cases in which these symptoms subsided after the thrombosis was relieved.

Sir William Gowers thought that the evidence of thrombosis in these cases of chlorosis was very small indeed.

Mr. Johnson Taylor asked Dr. Hawthorne how, if the

cavernous sinus were thrombosed, it happened that there was no proptosis. He thought it more likely that it was due to some blood change.

Dr. JAMES TAYLOR agreed with Sir William Gowers. Although the cavernous sinus may not be blocked, yet some of its tributaries might be, and this might account for the neuritis, but he thought that it was very difficult to see what caused it on both sides. Blocking of the arteries certainly does not cause it unless the embolus is septic.

Mr. ERNEST JONES read notes of a case.

Dr. HAWTHORNE in reply said that some chlorotic patients died who suffered from optic neuritis, and in these there was nothing but thrombosis present to account for it. He thought that the block need not necessarily be in the cavernous sinus, but if it were he should expect proptosis.

Mr. G. A. BERRY: **Note on the treatment of cystoid cicatrix following cataract extraction.**

It is not always possible to prevent the formation of cystoid cicatrices after removal of cataract, and when they do occur they are a source of danger to the eye on account of the way they facilitate the entrance of micro-organisms. The author has found that it occurs in about 2 or 3 % of cases operated upon.

As a rule, the opening is very small and can be seen readily if the conjunctiva be dissected up. For the treatment, he prefers to dissect up the conjunctiva and turn it down as a flap, then with the cautery to burn gently the small opening and at once replace the conjunctival flap. This always cures it, and he prefers this method to any other that has been introduced.

Endothelioma of the orbit associated with peculiar varicose condition of the vessels of the surface of the eyeball.

Mr. SIMEON SNELL (Sheffield) related this case, occurring in a girl aged nineteen. A marked feature was the varicose condition of the veins on the surface of the eyeball below, which had first been noticed about three months before the date of operation. There was also marked proptosis, the left eye being about $\frac{1}{4}$ inch in advance of the right. There was no œdema of the eyelids. The smooth surface of the tumor was felt in the floor of the orbit. Movements of the eyeball were normal except downwards, where there was some limitation. Vision was $\frac{6}{6}$. On October 28, 1901, the entire tumor was removed through an incision in the lower lid without interfering with the eyeball. It had only loose attach-

ments; it reached to the back of the orbit, close to the under surface of the eyeball, and along the front part of the optic nerve. It was encapsulated and measured 1¼ inch long and about ½ inch thick. The eyeball has since resumed its normal appearance, and the varicose condition of vessels has disappeared, and vision is ⅚. Mr. Treacher Collins examined the growth for me and reported it to be an endothelioma.

Case of ringworm of the eyelid in an adult, due to a large-spored trichophyton, probably of animal origin.

Mr. SIMEON SNELL also related this case, occurring in a healthy agriculturist aged thirty-four. He was first seen on December 17, 1901, with a large red patch on the right eyelid, which had commenced two weeks before as a rounded brownish-red pimple on the skin near the outer canthus. It gradually increased in size and now measures 2 inches by 1½. It is oval in shape with pustular points and well defined edges. It involves the outer half of the upper eyelid, reaches to the temple, embraces the outer commissure and the outer corner of the lower eyelid. The affected eyelashes and hairs of the eyebrow have fallen out or are loose. The pre-auricular gland and the gland beneath the jaw are involved. There are six other lesions on the right forearm and two on the left. In all the patches there is marked loss of hairs.

The patient kept cows and one had on the left side a white patch without any hair on it for about two months.

The ringworm apparently commenced on the right arm and the eyelid became affected by contact, the man working with his bare arms. Under the application of yellow mercuric oxide ointment improvement soon commenced, and to-day, January 30th, the patches on the arms have practically disappeared, and the one on the eyelid is only distinguishable by its greater redness. Under the microscope a large-spored fungus was found, probably *Megalosporon ectothrix*. Cultures from the hairs removed from the cow were not successful.

Observations on the visual purple of the retina. By F. W. ELDRIDGE-GREEN, M.D., F.R.C.S. (The expenses of this research were defrayed by a government grant of £10.)

I undertook this investigation in order to ascertain whether I could obtain any objective evidence of the diffusion of the visual purple into the yellow spot of the retina. Many phenomena point to this conclusion — such as the fact that a perceptible interval elapses before we are able to see with the yellow spot, and that

light may fall on the fovea without producing any sensation. My first experiments were made with the help of Mr. Treacher Collins. On examining the retina of a monkey it was at once evident that the visual purple extended to the yellow spot, but the very deep yellow of the spot prevented us from saying with certainty that the color altered on exposure to light. Mr. Treacher Collins and I have tried numerous chemicals in order to find out a substance which would fix the visual purple, but have not been successful. Nearly every chemical I used destroyed the purple. I then examined the eyes of two monkeys by myself. I tried to obtain a first view of the yellow spot of the retina through a microscope. It was at first red and then gradually bleached under the influence of light. I noted a curious appearance in one retina: on examining the region just external to the yellow spot, I saw rose-colored cones surrounded by one or more circles of colorless rods. My last observations were made with the help of Mr. Devereux Marshall. Two monkeys were kept in a dark room for twenty-four hours, and then Mr. Devereux Marshall excised their eyes under chloroform, the room being only illuminated by a ruby light. The retina, having been arranged on a slide, was put on the stage of a microscope and viewed with a white light. The whole retina was bright crimson, but the brightest part of all was the yellow spot, and it could be seen that the visual purple was situated between and not in the cones in the rod-free district of the yellow spot. Then the visual purple in a few minutes bleached, leaving the yellow spot in its usual yellow color. I must here express my great indebtedness to Mr. Treacher Collins and to Mr. Devereux Marshall, and also to Professor Starling for the use of his laboratory and the very admirable dark room at University College.

The following card specimens were shown:

1. Mr. GEORGE KEELING: **Unusual refractive change after removal of a congenitally dislocated lens.**

2. Mr. H. R. BELCHER HICKMAN: **A case of retinitis proliferans.**

3. Mr. G. W. ROLL: **A congenital anomaly of the optic disc.**

4. Mr. A. W. ORMOND: **A case of double anophthalmos.**

5. Mr. J. H. PARSONS: **Microscopic sections of pseudo-glioma due to a congenital membrane.**

6. Mr. INGLIS TAYLOR: **Fenestrated metallic balls used by Professor Pfluger in Mules's operation.**

7. Mr. HOLMES SPICER: **A case of third-nerve paresis with Argyll-Robertson pupil and marked association of convergence and contraction of the pupil.**

8. Mr. R. MARCUS GUNN: **Unusual deposit on inner surface of each cornea, of recent origin and slow development.**

FRIDAY, MARCH 14, 1902.

W. ADAMS FROST, F.R.C.S., VICE-PRESIDENT, IN THE CHAIR.

Symmetrical concentric folds of choroid and retina in four cases of unusually high myopia.

Mr. LAWFORD KNAGGS (Leeds) read a paper on a condition occasionally seen in highly myopic eyes. The appearance presented was that of a crescent, having a sharp, dark edge. It was always situated on the nasal side of the disc, and at varying distances from it, and when both eyes were affected the condition was symmetrical. It was vertically placed and its concavity faced the disc. It was two, three, or four times the diameter of the disc in height.

The condition producing this appearance was a folding back of the choroid and retina upon itself towards the disc—in other words, there was a detachment of both tunics from the sclerotic. The dark edge was due to the increased thickness of pigment at the summit of the fold where it turned round upon itself. Vessels curved round the fold as round the edge of a glaucoma cup.

The appearance had been met with in 4 cases. Both eyes were affected in 3, and in the other, one eye had been lost from accident.

The measure of myopia varied from — 18 D to — 38 D, neglecting astigmatism. In one eye there was a rent on the anterior surface of the fold through both tunics, showing the sclerotic, and the edges were turned towards the vitreous. In another there was a wrinkle of both coats on the nasal side of the crescent and parallel to it. In Haab's *Atlas*, Edition 1901, Fig. 79, a very similar appearance is shown, but is described as true staphyloma in a highly myopic eye.

The explanation was probably this: the anterior attachments of the choroid and retina, stretching unduly in consequence of the elongation of the eyeball, permitted the two inner tunics to slide back towards the posterior pole, but as they were both nailed to the sclerotic by the optic nerve, this sliding movement was

checked by the obstruction and led to a reduplication of the coats within the area over which the obstruction was felt.

Membranous conjunctivitis, with cases.

Mr. W. H. H. JESSOP read the notes of 13 cases which had been treated as in-patients at St. Bartholomew's Hospital. All the cases had adherent membranes, which left a raw surface when it was stripped off. Eight of these cases had the Klebs-Loeffler bacillus, giving the characteristic reactions. From a culture of 3 of the cases, guinea-pigs were inoculated, causing death in forty-eight hours, and showing necrosis of tissue at the seat of inoculation, and inflamed suprarenals. There was also enlargement of the neighboring lymphatic glands, the temperature was over 100°, albumen was present in the urine, but only 1 case had membranes in the fauces. In no case was there paralysis or paresis of the soft palate, or absence of the knee-jerk.

The other 5 cases were tested several times for the Klebs-Loeffler bacillus, but without success. Two had streptococcus pyogenes, 2 had staphylococcus albus, and 1 staphylococcus aureus. None had albuminuria, only 2 had raised temperatures, 2 had enlarged glands, but none had membrane on the fauces.

The diagnosis between diphtheritic and non-diphtheritic membranous conjunctivitis can only be made bacteriologically. In these cases the clinical evidence of albuminuria, raised temperature, enlarged glands, and signs of general diphtheria are a great aid in diagnosis. It is thus proved that all cases of membranous conjunctivitis are not diphtheritic, and that the type of severe diphtheritic conjunctivitis mentioned in text-books is rarely seen. The term "membranous conjunctivitis," which is a convenient one, must be enlarged to include cases due to diphtheria and other organisms.

Diphtheria of the conjunctiva.

Mr. SYDNEY STEPHENSON communicated notes of 43 cases of conjunctivitis in which diphtheria bacilli were found. The cases formed 1.25 % of the ophthalmic patients seen in two hospitals for children. The average age was 26.7 months, but 88 % occurred in children under four years. The cases chiefly occurred during the first four months of the year, and often there is a history of exposure to diphtheritic infection; 40 % of the children were bodily ill, although the series includes but three examples of really severe diphtheria of the conjunctiva. In 5 cases there was albuminuria, while in 2 the knee-jerks were absent. Diphtheria of

the fauces or nose preceded the conjunctival affection once, was associated with it twice, and followed it once. Diphtheria of the skin was present in 7 children. The pre-auricular and other glands were generally enlarged. The malady was unilateral in about ¾ of the cases. Death occurred once. The infection was "pure" in 13.95 %, and "mixed" in 86.04 % of the cases.

As regards treatment, Mr. Stephenson advised liberal and early doses of antitoxin with 1 in 5000 solution of corrosive sublimate applied to the conjunctiva by means of a small spray. He concluded that "croupous" and "diphtheritic" conjunctivitis were clinically and bacteriologically one and the same disorder.

After remarks by Mr. BREWERTON and others, Mr. JESSOP and Mr. STEPHENSON briefly replied.

The following card specimens were shown:

1. Mr. G. HARTRIDGE: (*a*) **Ectropion of uvea.** (*b*) **A large papilloma of conjunctiva.**

2. Mr. H. WORK DODD: (*a*) A specimen of a large **sarcoma of the orbit,** which had probably commenced in the choroid, and which had completely buried the eye. It was removed on account of pain, but the patient died shortly afterwards from secondary growths. (*b*) **Calcareous tumor of orbit.**

3. Mr. J. HERBERT FISHER: **Retinitis circinata.**

4. Mr. J. HERBERT PARSONS: **Degeneration of the retina.** (*b*) **Arcus senilis.**

5. Mr. LAWFORD: **Early changes in the retina, following a blow.** These were present ten days after the injury.

6. Mr. R. E. BICKERTON: **Unusual changes in the choroid.**

CLINICAL EVENING, MAY 1, 1902.

DAVID LITTLE, M.D., PRESIDENT, IN THE CHAIR.

Mr. H. GRIMSDALE showed a case of **paralysis of the cervical sympathetic.** There was a slight enophthalmos, pupil small and reacted very badly. Vision was bare P L, T − 3. Cocaine had no action on the pupil nor on the eyelid, and there was a gray reflex in the pupil, possibly a detached retina.

Mr. HOLMES SPICER thought that a purulent retinitis would explain all the symptoms, and he thought the case was one of those usually called pseudo-glioma. Mr. GRIMSDALE thought that the failure of the reaction of cocaine proved it to be a paralysis of the sympathetic.

Mr. GRIMSDALE also showed a case of **congenital unilateral ptosis in which movements of the eyelid were associated with suction.**

Mr. ADAMS FROST showed a case of **multiple ruptures of the choroid.** This was caused by a blow from the buckle of a belt. Some of the lesions seen were more like hemorrhages than ruptures.

Mr. ROCKLIFFE had recently seen two similar cases due to a blow with a steel hawser.

Mr. FISHER said that if some of them were hemorrhages they were in the choroid, and that therefore a rupture of some part of the choroid must have taken place in order to produce them.

Mr. FROST also showed a case of an **unusual retinal reflex.** The fundus was unusually dark, and the patient's father had retinitis pigmentosa. Mr. Frost looked upon this case as physiological.

Mr. TREACHER COLLINS: A case presenting **unusual opacities in the central part of each cornea.** The patient was a carman aged thirty-three, whose sight had been failing for two years. There had never been any real keratitis, but in the central part of each cornea are numerous white radiating lines of opacity; the periphery of the cornea is quite clear. Mr. Collins thought that these opacities were in the anterior layers of the substantia propria and were due to infiltration and degeneration with small calcareous deposits.

Mr. BRONNER thought they were very superficial and might be scraped.

Mr. LAWFORD had a somewhat similar case in a woman aged twenty-one, who has had recent ulcerative keratitis. This has given rise to a central corneal opacity without injection but with great photophobia. He scraped the cornea, and this is now being examined bacteriologically. He suggested that this might be done in the present case.

Mr. L. V. CARGILL: A case of **corneal opacity after instrumental delivery.** The case was a difficult brow presentation in which great force had been used with the forceps. The condition was clearing, and only a slight band of opacity now remained across the cornea.

Mr. G. W. THOMPSON: A case of **obliteration of a retinal artery following attacks of temporary amblyopia.** The patient is a woman who for the last ten years has suffered from

severe headaches with temporary loss of vision. In September last she had an attack from which the vision has never properly recovered, the dimness she then noticed persisting to some extent.

As a rule the vision returns after the attack has passed off. The disc is now partially atrophied.

Mr. LAWFORD thought this represented a most important class of cases, seeing how common temporary loss of vision is in association with migraine, and how seldom it is that ophthalmoscopic changes are seen in connection with it. Some of them may be caused by spasm of the vessels, which leaves the artery no less patent than it was before. He had recently under his care a man, aged thirty-five, who habitually overworked himself, and who, after being much underfed during Lent, had developed dimness in the right eye, which had persisted. For many years he has had temporary attacks of dimness, but now there is partial obliteration of one of the retinal arteries with hemorrhages, and at other places are seen old changes which apparently indicate lesser lesions of a similar nature in times gone by.

Mr. A. H. THOMPSON asked if it were a case of endarteritis obliterans, as he hardly thought spasm would last for so long a time.

Dr. JAMES TAYLOR thought that this case was similar to cases of temporary loss of function of some portion of the brain. This sometimes leads to permanent changes.

Mr. R. D. BATTEN described a somewhat similar case.

Mr. ROLL drew a parallel between this condition and Renaud's disease.

Mr. FISHER thought the tendency of opinion was that arterial degeneration was always present. This he did not consider was the case.

Mr. THOMPSON in reply was inclined to the opinion that there was endarteritis present.

Dr. BRONNER showed some sections of a **conjunctival lipoma** in an infant.

Mr. ROCKLIFFE: A case of very rapidly recurring **glioma of the orbit.**

Mr. LANG showed a child whose **orbit** had been **wounded** with a pitchfork. The ophthalmoscope showed a white patch of exudation where the disc should be, and he thought that the **optic nerve was torn across close behind the globe.**

REPORT OF MEETINGS OF THE OPHTHALMOLOGICAL SECTION OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. HENRY H. TYSON, Secretary.

MEETING OF JANUARY 20, 1902.

DR. JOHN E. WEEKS, PRES., IN THE CHAIR.

At the annual election of officers, Dr. John E. Weeks was re-elected Chairman, and Dr. Henry H. Tyson was re-elected Secretary for the ensuing year.

Dr. Herman Knapp read a paper on **the extraction of cataract by the simple method.**

He stated that the section should, in his opinion, comprise very nearly half the circumference of the cornea at the junction of the opaque and transparent margins. The section which has given him the best results is that which does nowhere deviate from this curved line, and is parallel to the plane of the iris. Often has he caught himself on an irregular deviation near the puncture on the temporal side. The reason of it was that he introduced the point of the knife parallel to the plane of the iris, from the beginning, and, probably by an unconscious intention, passed it too long between the lamellæ of the cornea. This had the double consequence of making the section irregular, and what is worse, shorter than it was designed. This fault is avoided when the tip of the knife during the puncture is directed somewhat in and backward, until the lustre of the tip shows that the latter is in the eye. This is an old rule, but having failed a number of times, he mentioned it. The knife, when the point is in the anterior chamber, is pushed forward somewhat rapidly, until the counter puncture is made on the level of the puncture and exactly at the

line of separation of the opaque and transparent cornea. If this is not obtained, the knife is drawn a little backward, and put in the right direction. To do this, one must have a good knife, the point of which should not be flexible, so as to bend when, during its passage through the cornea, it meets with too great a resistance, and produces a crooked and bruised wound canal.

If the section is too small—the most disastrous of all mistakes, as is well known—it manifests itself when the cataract presents in the gap but does not advance: the hard lens pushes its way half into the section, the flap tilts insufficiently, showing that the opening is too small for the lens to pass through. The remedy is easy: Take strong strabismus scissors, the tips of whose branches are well held together and their edges sharp, so that they enlarge one, or, if necessary, both angles of the section without bruising the cornea.

The stoppage of the lens may have another cause: the capsule is not opened. One may recognize the fact when by a sufficient section the pressure pushes the lens toward the gap but its edge will not present, and when with a small hook the iris is drawn back the lens will not tilt. A straight sharp cystotome passed across the upper part of the pupil will at once release the tension and allow the cataract to pass out of the eye.

The opening of the capsule: For many years he has opened the capsule under the upper part of the iris more or less parallel to the corneal section. He thinks it was Professor Gayet of Lyons, France, who practised this section first methodically; Dr. E. Gruening practised it in Morgagnian cataract, and Dr. Knapp in all cases. It is one of the features in his operating to which he ascribes a special importance, having seen that in promiscuous openings of the capsule there were posterior synechiæ just and only at the points where shreds of lacerated capsule touch the notches in the iris at its pupillary edge. To avoid the agglutination of two raw surfaces, he passes the point of the cystotome behind the upper part of the iris, turns it on its longitudinal axis, and opens the capsule from the nasal side of the iris to the temporal.

In this way the notched iris cannot come in contact with torn shreds of capsule. Synechiæ, after so operating, are very rare, and when they occur, it is almost always at the edges of the capsular scar, which did not lie high enough up to be out of the reach of the lacerated edge of the iris.

The opening of the capsule is very important. When the point of the cystotome is not sharp enough, or when we press too much on the lens, it is apt to be dislocated, and escape of vitreous may occur during the operation, or prolapse of the iris during the first night. It is just as easy to evacuate the cataract completely through this peripheric section as through a promiscuous opening in the centre. The capsule will wrinkle in the course of some months, and this, no sooner than all the symptoms of irritation are passed, is the time to clear the pupil by a discission through the cornea, which in most eyes gives an ideal result, both as to sight and endurance for work.

The expulsion of the lens is usually done by pressure with the curved surface of a spoon. In some cases, particularly in dislocated cataracts, it is advisable to expel the lens by external pressure with the fingers, using the margins of the lids as the intermediary part. Judicious pressure not rarely expels in this way chalky cataracts floating in the vitreous. The expulsion of remnants is effected in the same way.

The bandaging is done in the old way by occluding the operated eye with sterilized gauze and cotton. The other eye may be covered during the first night, then shaded with a blinder of gauze, so that the patient can look with that eye from time to time, but he should not move the eye much.

The open treatment of Schioetz has decided advantages, but he would not use it in nervous or restless patients.

The different protectors are, in his experience, more or less unpleasant without always warding off accidents. He continues the handcuffs, and gives every cataract patient a special nurse for the first nights.

Dr. E. GRUENING read a paper on **the extraction of cataract by the combined method.** He stated that in speaking of the combined operation he did not wish to infer that he preferred the combined to the simple operation. The combined operation is applicable to all cases of cataract and has, therefore, a wider field, while in this sense the simple operation is restricted. If the simple operation is indicated in uncomplicated cases, the combined operation is necessary where additional difficulties present themselves, either on the part of the patient or on the part of the organ to be operated upon. It is, therefore, not correct to compare the results obtained by the simple with those of the combined operation. When we have to deal with a restless, nervous, coughing,

straining individual, we shall resort to the combined operation. If the patient is quiet, self-possessed, sound in mind and body, we shall use the simple operation.

Again, if we have anterior or posterior synechiæ, luxation of the lens, complications with glaucoma, and other conditions which require iridectomy, we shall resort to the combined method of extraction.

In choosing the local anæsthetic, he preferred holocaine, as he stated that it had a greater anæsthetic action upon the iris than cocaine, and it was therefore the anæsthetic *par excellence* in the combined operation. With regard to the iridectomy, he cuts the iris with one stroke of the scissors instead of three, as advocated in the Berlin school, and exercises care in removing the iris out of the angles of the wound.

In every iridectomy there are three acts that should be done simultaneously, and for these three acts we require three hands: one to fix the eyeball, another to seize the iris, and a third to cut it. As we are possessed of two hands only, we must either forego one act or delegate it to an assistant. We must either operate upon the unfixed eyeball or allow an assistant either to fix the eyeball or cut the iris. For the fixation of the eyeball, much training is required, more than can be expected of the ordinary assistant in the hospital with his limited time of training. It is safer, especially with the use of holocaine, to let the assistant cut the iris, or forego fixation, and do the two acts of seizing and of cutting the iris oneself. The independence of the operator from an assistant is one of the great advantages of the simple operation over the combined.

With regard to the cystotomy it has been his practice to make a peripheral cut in the capsule just as Dr. Knapp does, but he adds a vertical incision, giving the cut a T shape. His reason for doing this is, that such a T-shaped section allows as ready an expulsion of the lens as the peripheral section alone, and, in addition, at times obviates the necessity of a secondary operation. If the capsule is very much thickened in the centre, he uses the capsular forceps and thus removes either the capsular cataract alone or the whole lens with the capsule.

With regard to the after-treatment, he bandages both eyes, keeps the patient in bed, on liquid diet for two days, and on soft diet to the end of the week. The eye is inspected every day. On the fourth day the operated eye only is bandaged. On the eighth

day the bandage is removed and the patient is allowed to be out of bed.

The after-treatment is the same in the simple and in the combined extraction.

Dr. P. A. CALLAN read a paper on **the treatment of the capsule after cataract extraction.** He stated that an ideal cataract operation would be the removal of the opaque lens within its capsule from the eye, and thereby obviate the necessity of further interference in the majority of the cases. However, this method can be safely tried in only a small percentage of operations, where the capsule is thickened and the zonula not too firm.

In the usual operations for cataract, the capsule plays a very important rôle. No matter what method we resort to in our use of the cystotome, the greater part of the anterior capsule remains within the eye to proliferate epithelial cells, and in conjunction with the posterior capsule forming a more or less closed sac containing lens matter.

In complicated cases where the extraction is followed by infection or inflammation of the iris or ciliary body, the capsule acts as a receiving membrane for the exudates. It is therefore both an active and a passive factor. It is an active agent even when years have elapsed after the cataract extraction; and it is both active and passive in severe inflammations following extraction.

Capsular membranes requiring surgical interference vary in density from the thinnest diaphanous tissue to the thickest mat of exudate that prevents all light reflex from the fundus. A fine diaphanous membrane interferes considerably with good visual results, if it is fluted, wrinkled, or rumpled. Incarceration and prolapse of the iris draw the pupil toward the corneal cicatrix until the opening between the chambers may disappear at the apex of the original section. Besides the capsular membranes that we ordinarily see, there are occasionally bands of connective tissue after loss of vitreous that form behind the posterior layer of the capsule.

What amount of vision calls for operation on secondary cataract?

It altogether depends on the needs of the patient, and must necessarily vary with the intellectual status of the individual.

He does not hesitate to operate if the vision is $\frac{20}{40}$, provided the patient is willing to assume his quota of the risk.

How soon after the cataract extraction should we operate on the capsular membranes?

Not until the eye has fully recovered from the effects of the first operation. If there has been severe inflammation following the extraction, we must defer the second operation for a considerably longer period than would be necessary if there had been little or no reaction.

If by waiting the eye continues irritable or inflamed, owing to the incarceration of the iris or an occluded pupil, it may be necessary to operate sooner than would be expected under ordinary conditions.

If the surgical interference is put off too long, the eye degenerates and may sympathetically affect its fellow. An early operation under these conditions may be imperative, but it is by no means always successful, owing to inflammatory exudates and blood closing the opening.

What are the dangers to be feared in operating on cataracta secundaria?

Infection and too much traction on the ciliary processes. Under ordinary circumstances, the danger from infection is slight. The chief danger is the traumatism to the ciliary body by our method of operating.

In operating on membranous cataracts he has found two methods quite ample for all cases that are usually met with.

A simple discission performed according to Dr. Knapp's method on thin membranes gives excellent results. But the membranes must be uniformly thin; there must be no tough bands in the field of operation which resist cutting, otherwise the knife-needle exerts too much traction on the ciliary processes. For all other conditions, including thick membranes, occluded pupil, incarceration of the iris, he uses the iridotomy scissors.

The guiding principle in the surgical treatment of capsular membrane is to inflict as little traumatism on the ciliary processes as possible in the attainment of the object in view—a clear pupil.

To accomplish this aim with the least risk to the eye, the success of the method should not be due to tearing the obstructing membranes, as the safety of the operation consists in cutting. Therefore, any method that combines tearing and cutting the capsular membrane is not as safe as the operation due solely to the latter. Bowman's method, consisting of the use of two needles, is purely and simply a tearing operation, and as such to be rejected.

To my mind, the surgical treatment of thick, tough membranes is narrowed down to the use of two instruments—a well-ground, thin Graefe cataract knife or to iridotomy scissors. The knife cuts by traction on the iris and ciliary processes in ratio to the thickness and toughness of the mass; furthermore, the incision must be in a straight line, and we have no control on the ultimate shape of the opening, which is to serve as a pupil.

In operating with the scissors, there is no traction or tearing; tissue between the blades is cut and not lacerated; there is absolutely no traumatism to the ciliary processes. The size and shape of the opening in the densest mat of exudate is under our control in the manner that we manipulate the scissors. A word of caution in regard to the position of the corneal incision for the introduction of the scissors. As a general thing, we have a fixed membrane to deal with, but if the pupil is mobile and very active, as we find it in children, the corneal incision must not be too peripherally placed, otherwise the heel of the scissors cuts the iris.

DISCUSSION.

Dr. C. S. BULL stated that in performing either a simple or combined operation he did not require an assistant, and considered one operation just as easy as the other; also that under no circumstances should any operation that tears be used in opening the capsule in secondary operations. He prefers scissors in all operations upon thick capsules, and considers the management of secondary cataracts more important than the primary operation.

Dr. MITTENDORF stated that the class of people as well as the eyes should be considered. He considers those coming from tropical countries, as a rule, possessing a tendency towards being difficult cases. He strongly recommends free irrigation with boric-acid solution, from one half to one pint in quantity, after operation.

In closing the discussion, Dr. KNAPP stated that Bowman's needle should never be used, as it was obsolete. He also stated that removal of an uncomplicated cataract with capsule ought to be obsolete. It should be performed only when the suspensory ligament was torn or weak.

Dr. GRUENING stated that he also had performed the combined operation without assistant, but in some cases traction and detach-

ment of the iris at the ciliary junction and severe hemorrhage ensued. In doing the combined operation, he considered it prudent to have an assistant aid him.

Dr. CALLAN emphasized the point in his paper, not to tear or use traction, but to cut membranes.

MEETING OF FEBRUARY 17, 1902.

Dr. ARNOLD KNAPP presented **a specimen of hæmangio-endothelioma of the eyelid.**

Specimen was from a tumor of the left upper eyelid of a child eight months old. The swelling was noted soon after birth and increased in size. It occupied the upper surface of the tarsus and was soft and bluish in color. The tumor was dissected out without difficulty and was found to be situated between the orbicularis and the tarsus. Histologically the growth was capsulated and divided into lobules by fibrous septa. Each lobule was composed of many large cells and open spaces containing blood. Each blood space was lined by a layer of large nucleated cells (endothelium); the intervening regions were filled with the same kind of cells.

Dr. H. KNAPP stated that he had operated upon the case reported, and when first seen thought it was a cavernoma,— it had an alveolar appearance,— but the microscope showed it to be an endothelioma.

Dr. WEEKS stated that he had seen similar cases and thought them quite common, presenting the appearance usual to such tumors.

Dr. ARNOLD KNAPP presented **a case of tumor (endothelioma) of the orbit** and gave the following history of the case:

Patient, female, twenty-seven years old, noticed one and a half years ago that the left eye protruded. The eye was pushed straight forward; mobility in every direction was slight and equally restricted. On palpation no tumor could be detected. Optic neuritis, V = $\frac{20}{200}$, field normal, nose normal, right eye normal. Operation November 14, 1901. After access had been gained to the orbit, according to the Krönlein method, a tumor could be felt extending from the eyeball back to the apex of the orbit and surrounding the optic nerve. This could be separated from the surrounding structures by blunt dissection, except its attachment to the optic-nerve sheath, in which the tumor apparently originated. In endeavoring to separate this the capsule ruptured and soft tumor masses were evacuated. These were removed and the

wound closed. The course of healing was interrupted by suppuration and a subsequent operation was necessary to replace the bony wedge. The wound was finally healed on January 3d. At the present time there is no deformity beyond an adherent cicatrix. The eye is in its normal position but adducted. There is no mobility out or up. The optic disc is somewhat discolored. V. is now $\frac{20}{200}$. Microscopically the tumor proved to be an endothelioma.

Dr. H. KNAPP stated that he had performed operations for the removal of tumors of the nerve sheath, cutting them out between the external and inferior recti muscles. He stated that the Krönlein method was not applicable to lachrymal tumors, but was indicated in optic-nerve tumors in the muscle funnel or deep in the orbit. He does not like the scar which the Krönlein method leaves.

Dr. WEEKS stated that the Krönlein method afforded an excellent exposure of the orbit, but that it did not afford the access to the contents he anticipated. He thought that these tumors were alveolar sarcomas. Reports of cases show paralyses of the external recti very common.

Dr. A. KNAPP thought that if the operation was properly performed, no scar would remain.

Dr. ARNOLD KNAPP read a report of a case of **varicose veins of the orbit cured by ligature.** The patient, female, twenty-eight years of age, noticed a swelling in the lower lid three years ago, which would increase in size on stooping over. A bluish, ill-defined tumor was situated in the inner part of the lower eyelid; the entire region swells on holding the head down. An incision was made down to the tumor, which appeared as a convolute of two or three blood-vessels; these were seized with a forceps, dissected free as deep as possible, tied with a ligature, and cut off. There was no hemorrhage. The wound was closed and healed readily; there has been no recurrence.

Dr. ARNOLD KNAPP read a report of a case of **blindness following periostitis of the superior maxilla of dental origin.** He stated that on November 26th L. G., sixteen years old, had the right canine and second incisor tooth filled at line of gum, on the third day after had some toothache, the right half of the face began to swell and the right eye was closed. Five days later the gum in front of the canine tooth opened and discharged pus. The swelling of the face diminished and the eye opened

after having been closed for a week. The patient immediately noticed that she could not see with that eye. She came to the dispensary on December 17th, three weeks after the tooth had been filled. The pupil was dilated and immobile. The optic nerve was white, the vessels were normal, slight atrophy of choroid about the disc. The anterior surface of the superior maxilla was swollen and tender. In the floor of the orbit there was a firm, resisting, flat swelling. A fistula discharging pus was situated in the canine fossa; a probe could be passed upward and forwards under the periosteum and rough bone detected. The mucous lining of the outer wall of the inferior nasal meatus was swollen; aspiratory puncture of the antrum of Highmore was negative. In the subsequent course the eye has remained blind, the disc is white, some of the arteries especially near the disc can hardly be recognized. The swelling in the floor of the orbit remains; the discharge from the fistula has almost ceased. It is stated that processes starting from caries of the teeth (alveolar periostitis) may produce a retrobulbar phlegmon or orbital phlebitis. The signs present do not seem to have been sufficiently severe for either of these affections, and that we have to deal with a periostitis which extended to the floor of orbit, where it has left some thickening, and thus involved the nerve in the optic canal.

Dr. W. E. LAMBERT presented a case of **pulsating exophthalmos with peculiar complications.** He gave the following history: The patient, a boy aged twenty, was seen at the Polyclinic early in December; there was very marked protrusion of the right eyeball, engorgement of the conjunctival veins, and at the inner canthus a small pouch of very vascular orbital tissue; from this point the boy complained that recently there had been several very severe hemorrhages. There was distinct pulsation on palpation of the eyeball and a bruit could be heard over the neck. The boy also complained of blowing sounds in his head. The retinal veins were somewhat engorged; the vision, however, was $\frac{20}{40}$. On the forehead, extending from the inner margin of the orbit upwards, was a pulsating tumor and another in the posterior fontanelle. The history of the case was that four years ago the boy was struck in the right eye with a potato; the eye swelled up immediately; the next day the eyelids were closed and the inside of the eye looked black; could not see out of it. The swelling gradually subsided, but never has returned to its normal condition or appearance. About two years after the accident, the swelling in

forehead appeared, and has gradually increased since ; the boy thinks the swelling in back of head appeared at the same time, but is not sure of it. The patient was admitted to the hospital for the purpose of ligating the right carotid. A few days before the operation was performed a very severe hemorrhage occurred, on examination complete eversion of the lower lid was found, and a mass of orbital tissue projected from the eyeball and the inner surface of the lower lid. Dr. Wyeth operated on December 16, 1901, ligating the internal and external carotids, lingual and facial branches. The patient made an excellent recovery, the exophthalmos somewhat subsiding, but the protrusion of orbital tissue did not disappear, and frequent hemorrhages continued to occur,— at one time a rather severe arterial hemorrhage from a point near the inner canthus. The case was then referred to Dr. Lambert, and a mass of vascular tissue dissected out, which was attended with no little difficulty, as the hemorrhage was severe, several small vessels having to be ligated in the course of the operation. Since that time, three weeks ago, there has been no recurrence of hemorrhage, and now closure of the lids is almost possible. Rupture of the internal carotid in the cavernous sinus, producing an arterio-venous aneurism, was considered to be the cause ; there probably was a congenital malformation of the cranium, with incomplete closure of the posterior fontanelle.

Dr. H. W. WOOTTON read a paper on **insufficiency of divergence as an etiological factor in convergent strabismus : its importance, determination, and treatment.**[1]

The conclusions were drawn from the results observed in twenty-eight cases of convergent strabismus operated upon by advancement of both externi, no attention being paid to indications or contra-indications, Dr. Wootton seeking to discern which cases were best suited for this procedure. It was held that the functions of divergence and convergence were both active and independent. In support of the theory that divergence could not be considered merely as a passive attribute to convergence, the case of functional paresis of divergence, unassociated with any convergence anomaly, which was recently reported by Drs. Lynch and Duane, was cited. It was also shown in this connection that while divergence was incapable of augmentation by prismatic exercises, its power could be increased to many times the normal by advancement of the externi, without reducing the power of con-

[1] Published in full in this volume, p. 159.

vergence below normal limits, and he believes that the secondary insufficiency of divergence existing in most cases of convergent strabismus was accountable for the maintenance of the deviation, in part directly and in part by permitting the continuance of a diminished convergence spasm, in the majority of cases which have resisted the prolonged influence of their full correction. The insufficiency of divergence occurring in convergent strabismus was believed to be due to the prolonged disuse of this function caused by the long continuance of the angular deviation. The insufficiency was held to be paretic in nature and dependent upon a partial atrophy of the external recti. He does not believe that it is present in all cases of strabismus, even in all those of long duration, and gave the methods which he employed to determine its existence. He did not believe that it exists in cases of periodic squint, or in those in which the deviation is manifest only for near points. In most cases in which the deviation is manifest both for distance and near, he believed this condition to be present, but not in all, and regarded the results of the examination of the field of fixation as of great value in the diagnosis, when a marked restriction of the external rotations was revealed. The results obtained from the prolonged use of the full correction were also considered of great service in this connection. In regard to treatment, he considered the advancement of both externi as the safest and most satisfactory method of treating convergent strabismus when an insufficiency of divergence was present, but thought that the existence of this condition was absolutely essential for the success of this operation.

Dr. DUANE believed that in nearly all cases of ordinary convergent squint a divergence-insufficiency was present. In some cases, and in his experience more frequently than Dr. Wootton seemed inclined to admit, it was the primary factor in producing the squint, being then almost always associated with a secondary convergence-excess. In other cases, it was itself secondary, the convergence-excess being the primary factor. This combination of a convergence-excess with a divergence-insufficiency in a convergent squint is well shown when we correct the squint either with glasses or by a tenotomy. These abolish the element of faulty convergence, but leave unchanged the divergence-insufficiency, whose features we can then readily recognize. Such a residual divergence-insufficiency often itself diminishes afterwards in these cases, and this is perhaps an argument for employing

tenotomy rather than advancement as the initial procedure in squint of this kind. As regards divergence-excess, he thought it a much more frequent cause of divergent squint than is usually supposed. In particular, he believed that a number of the cases of divergent squint that develop after tenotomy of the internus were due to divergence-excess and not to any weakness of the internus produced by the operation.

Dr. GILES stated that he had tried the operation with success, and while at first skeptical, he was now convinced of its beneficial effect. He has not seen over-effect, but has seen cases of under-effect which could be remedied by graduated tenotomies of the internal recti.

Dr. HEPBURN stated that he had made tests as to the extent of development capable in the various muscles. He found that the internal recti overcame 95° prism; external recti, 21° prism; vertical recti, 12° prism. He stated that failures in the result of operations on the muscles were due to the fact of selecting the wrong method of operating. In divergence excess he prefers the Landolt method.

MEETING OF MARCH 17TH.

Dr. R. DENIG presented a case of **a free cyst in the anterior chamber,** and gave the following history: The patient, thirty-one years of age, had a small, freely moving congenital cyst in the anterior chamber of her right eye. When her head was held in a normal upright position, the cyst was found in the lower part of the anterior chamber; if, however, the patient inclined her head or turned it to one side, the cyst moved toward that side, slowly resuming its former place after the head was turned back or raised. Dr. Denig thought that such cysts were probably developed from detached melanomas on the edge of the iris.

Dr. W. B. MARPLE read a brief report of an **epithelioma of the eyelid which disappeared entirely under the use of a solution of adrenalin chloride.** The patient was first seen June 5, 1901. She was a married lady about forty-five or fifty years old. She had a small growth on the left lower lid, which began about six years ago in the middle of the lid, and gradually crept toward the outer canthus. During the past winter it had annoyed her considerably, becoming easily inflamed and bleeding easily. No pain. When first seen by Dr. Marple the appearance was as follows: The border of the left lower lid was the seat of a charac-

teristic epitheliomatous infiltration extending from the external canthus beyond the middle of the lid, 18 *mm* in length. The nodular infiltration at the middle of the lid extended downward 6 *mm*, and the lid was notched here. This infiltrated area is more or less red; the microscope revealed the characteristic histological picture of an epithelioma; removal was advised, which the patient consented to have done in the fall. She was given a solution of adrenalin chloride as a placebo to drop into the eye every evening, as the growth looked quite irritated. She left the city for the summer, and he did not see her again until January of this year, when he found that the growth had entirely disappeared, and along the border of the lid was a small indrawn cicatrix, the lashes gone. The patient said that she used the adrenalin regularly for three months until the end of September, after that irregularly; after using the drops a month or six weeks, she noticed that little brown scales formed, which came away either spontaneously or with the least rubbing, leaving the mass always smaller until it had entirely disappeared. She has not used the adrenalin now since Christmas. This was the only medicine she used at all after she was first seen by him.

Dr. SEABROOK stated that he had seen several cases during the past years where various applications had removed epitheliomatous growths, but had not seen any where the adrenalin had been used.

Dr. MEIERHOF thought that it was the chloratone which might have caused the cicatrix, as it possesses a mild cauterizing effect, although it might have been the combined effect of the chloratone and adrenalin extract.

Dr. SEABROOK presented a case of **choked disc with little swelling.** The patient, a man aged fifty-four years, had choked disc in the left eye, with right homonymous hemianopsia. The field for white was cut off 15° to the right of the median line. The hemiopic field for colors corresponded to the field for white; no scotomata. The left optic papilla was slightly swollen, with an old exudation covering it. No indications of hemorrhages. The right disc was pale, vessels rather small; vision, R $\frac{20}{30}$ w. + 4 D, L $\frac{20}{30}$ w. + 4.50 D. Direct and consensual pupillary reaction with light reflection upon any portion of the retina. The patient denied any specific history, but stated that he had been ill from spring to autumn for six years, but gives a history of no positive symptoms except general malaise and sensations of heat and chills

in the middle of the day. He dates the beginning of the confusion of sight three years ago. Had extreme dizziness, with vertiginous sensations and staggering, for two or three weeks, beginning five months ago. No symptoms present indicating any lesions. He is uncertain as to localization of lesion, but thought it was probably cortical.

Dr. WEEKS stated that a sector or quadrant field might be due to a cortical lesion, but that he did not think that the field reported was typical of such a lesion.

Dr. KOLLER presented a case of **perforating wound of the sclera,** in which the flaps were retracted when first seen. He had sutured the sclera with silk sutures, passing them entirely through it on account of its thinness. Result good.

Dr. H. KNAPP stated that the suturing of scleral wounds was not so essential as some oculists claimed, as they mostly heal well without suturing.

Dr. DENIG presented two cases of **high myopia operated upon for its relief after Sattler's method,** namely to endeavor to remove all the lens matter possible at one sitting. His results were good. He thinks that Sattler's operation is not one free from danger as prolapse of the vitreous is liable to occur, and has occurred to himself and others.

Dr. LAMBERT reported a case of **removal of a foreign body from the eye.** A piece of an eyeglass which had been broken by a blow from a racquet had penetrated the cornea in the inner side, passing transversely across the anterior chamber through the pupil and into the lens, the larger portion of the glass lying behind the iris on the outer side. The glass had been in the eye two weeks when the operation for its removal was performed. After the corneal section was made, several ineffectual attempts were made to extract the glass with various kinds of forceps; finally the glass was removed with a wire loop; some vitreous was lost, but the wound healed kindly, with V $\frac{20}{100}$ at the present time. The glass measured 7 *mm* in length, 5 *mm* in breadth, and 2 *mm* in thickness at one end, tapering to a knife-like edge at the other.

Dr. DUANE read a paper on **the hygienic and prophylactic treatment of myopia.** He stated that the prophylactic treatment in myopia consists in the following: (1) Making the patient wear the full correction of his myopia all the time, both for distance and near. This is of prime importance in all varieties of myopia, low, medium, and high, and if applied early may check

the progress of the myopia altogether. (2) Proper attention to illumination, the size and legibility of the print, the quality of paper used in the books read, the relative height and disposition of the seat and desk, and the many other factors that have been brought out by the zealous investigators into the subject of school hygiene. These are important, but subsidiary matters. (3) In low and medium myopia, moderate restriction of near work, or rather its better distribution, so that it is done mainly by daylight and not for too long at any one time. Furthermore, momentary rest of the eyes at frequent intervals during the work. These rules to be the more strictly enforced, the higher the myopia and the younger the patient. (4) In high myopia with evidences of progress, much more stringent restriction of near work. Open-air work to be encouraged, and the adoption of confining and eye-taxing occupations forbidden. (5) In medium and in especially high myopia, plenty of sleep and out-of-door exercise. (6) Re-examination of the patient at frequent intervals (which in the case of high myopia should be more frequent) to determine how much the myopia has increased. If it has increased, the glasses should be increased also up to the full strength, and the hygienic regulations, above detailed, modified accordingly. He believed that the influence of near work in producing myopia, or at least in causing its increase, had been considerably overrated; the statistics upon this point being more or less misleading.

Dr. LAMBERT read a paper on **the correction of myopia by glasses,** in which he spoke of the various methods of testing for errors of refraction, giving the preference for accuracy to the shadow test. He advocated the use of a mydriatic in testing all cases of myopia, unless its use was contra-indicated by age or other conditions; he also advised a full correction of the existing astigmatism and a full correction in young people of the myopia of moderate degree, the correction to be constantly worn. In older people, a full correction when it is possible for them to wear it for distance, giving a weaker glass for proper reading distance. Prisms combined with the correction of the myopia for the common associated muscular insufficiency, he thought were usually not satisfactory, and if the disturbance in muscular equilibrium was an important factor in producing the asthenopia, operative treatment of the muscles was demanded. In high degrees of myopia, or myopia complicated with a diseased condition of the fundus, the correction by glasses is largely incidental to the more important

general treatment of the case; and one has to be guided by experience and common sense.

Dr. P. A. CALLAN read a paper on **the operative treatment of high myopia.** After reviewing the history of the operation from 1776 to the present day, he stated that no surgeon had the moral right to over-persuade a patient to submit to an operation that may result in the loss of a seeing eye. At first the operation was limited to young persons with a myopia of 16 D and over, and in sound eyes. Since then as low as 9 D has been operated on, and cases with a moderate amount of choroidal and macular changes with a vision of $\frac{1}{10}$ have not been deterrent factors. The same holds true of age; cases as old as forty-eight years are occasionally reported as operated upon. Prior to the operation, it is not possible to estimate accurately what the resulting refraction will be after the removal of the lens. This must be due to various causes,—the different methods of testing, the position of correcting lens in front of the eye, the varying depths of the anterior chamber, position and shape of the lens, and the resulting operative astigmatism. The following rule has been formulated, that gives a good approximation of the ultimate refraction: Divide the correcting glass used before operating by two and subtract from this value the refracting index of the lens = 10 D. It must be understood that there are great variations from this rule. Widmark reported a case of a woman with 9 D, where after the operation the eye was emmetropic. It appears to him a mistake to operate in a case of less than 10 D, even in a child of twelve years, and not less than 16 D in an adult, except when the correcting lens cannot or will not be worn. The objections to the operation are based on the loss of the accommodation and the risks due to all operations. Donders's chief objection was the loss of the accommodation. No doubt this is of moment, but every surgeon knows how after their successful cataract operations patients adapt themselves to the new order of things; many of them, especially the young, seem to possess a pseudo-accommodation. If we confine our operations to 16 D and over, the majority need nothing for distance to enable them to see infinitely better at distances than before with the strong common lenses. The objection to any operation on a seeing eye that may lead to blindness is a valid one, but we must conclude that very many of these very high myopia cases are heavily handicapped in the struggle for a bare existence, while not a few are shut out from all

means of livelihood for which their previous training fitted them. As regards the method of operating, he stated that the large flap extraction was more likely to be followed by loss of vitreous, intraocular hemorrhage, detachment of the retina, incarceration or prolapse of the iris, not to speak of the greater danger of infection on account of larger wound. In operating by discission and linear extraction, vitreous may be lost and cause detachment of retina by manipulation to remove the swollen lens matter through a small opening. The rapidly swelling lens may produce glaucomatous tension, iritis, etc. In simple discission and subsequent paracentesis, there is the least danger of all methods of operation in high myopia; we must not lose sight of the fact that the majority of our patients are young, and a few months more or less in waiting for good results should not hurry us to select a quick method. Do not forget that the more radical and rapid the method the greater the danger of inflammatory sequelæ. The operation is a legitimate one when confined to cases of high myopia. Vision is improved, the visual field enlarged. The high concave lenses are dispensed with, the stretching of the globe comes to a standstill, or increases, if any, but slowly. Subsequent detachments do occur in many instances, but these take place, as we know, in a given percentage without operation. In the few cases which he has operated, the patients were greatly benefited and very much pleased with the result.

Dr. C. S. BULL stated that he would confine his remarks to two points: (1) hygienic care of children; (2) method of operating in high degrees of myopia. He said that no difference of opinion existed as to the treatment with glasses, all believing in giving full correction. He thought that the schools and colleges demanded too much from the scholars as regards the strain placed upon their eyes. In operating in high degrees of myopia, he said that he endorsed all that had been read by Dr. Callan on that subject. Under no circumstances would he advise an operation in myopia with any changes in the macular region demonstrable with the ophthalmoscope; he would not operate upon any sound myopic eye of less than 16 D. He advises strongly against the extraction method in eyes of young people. He said that the cardinal point was the absolute freedom of the macular region from any degenerative disease.

MEETING OF APRIL 21, 1902, J. E. WEEKS, M.D., CHAIRMAN.

Dr. J. GUTTMAN presented a case of **amaurotic family idiocy** with the usual history of such cases. Russian Jew, mother of child had given birth to ten children, three of whom had died with similar disease.

Dr. LESZYNSKY stated that he had seen the child previously, and that if it had not been for the ocular changes a diagnosis could not have been made, as the other symptoms had not manifested themselves.

Dr. REESE presented a case of **implantation cyst of the iris.** The patient gave a history of having been struck in his left eye with a piece of steel wire five months ago. Three months later, he noticed a small white nodule in upper part of anterior chamber. *St. Pr.*—In the upper part of the anterior chamber at the root of the iris is a grayish-white cyst about the size of a small shot. Extending from this cyst through the pupil into the posterior chamber is a cilium. The follicular end of the eyelash is in the anterior chamber, and the other end can be seen in the posterior chamber through the rent in the iris. Vision is normal.

Dr. WEEKS stated that a majority of all iris cysts were implantation cysts, and that all that it was necessary to carry into the iris was epithelium in order to produce a cyst of this kind. The treatment consisted in removing the cyst, or in opening it and treating the same.

Dr. WOLFF presented a case of **congenital bilateral displacement of lenses upwards and inwards** in a child five years of age. The refraction of the eye through the lens was myopic 18 D, and through the pupil, and not through the lens, was hyperopic 12 D. The border of the lenses bisects the pupils. He was quite sure she had monocular diplopia. He desired to know whether it would be advisable to remove the lenses in these cases.

Dr. WEEKS stated that in the majority of cases vision was below normal, and he thought the lenses should be needled, and then with proper correcting lenses vision should be much improved.

Dr. HALLOCK presented a case of **double optic atrophy due to drinking wood alcohol.** One evening in the early part of last January, patient drank a teacupful of methyl alcohol. She was unconscious through the night, and the next day she was totally blind. She asserted that since then her sight has been getting better; but Dr. Hallock thinks that it is not better,—if anything,

that it is worse. She has been taking strychnia for the past four months with no improvement in vision. Pupils react to light. R, she counts fingers at nine inches; L, at three.

Dr. CHAMBERS presented a patient who had had a **piece of steel** which had lodged **in the iris** and which had been removed with the Johnson magnet. The wound had healed kindly, and excellent vision remained intact.

DR. CAREY IN THE CHAIR.

Dr. WEEKS presented a case of **restoration of the lower lid with a Wolff flap** from the arm, after cicatricial ectropion. The flap was $1\frac{3}{4} \times 1\frac{1}{4}$ inches. He stated that it requires about three months for the flap to reach its maximum degree of shrinkage, and the area left is about one fifth of the original flap.

Dr. WEEKS presented three patients with **simple chronic glaucoma,** who had been operated upon by resection of the superior ganglion of the cervical sympathetic. One of the patients had had the ganglion removed from each side, two of the operations had been performed by Dr. John F. Erdmann and two by Dr. Weeks. The incisions varied from 3 to $1\frac{1}{2}$ inches in length. Healing was by primary intention in all. The ages of the patients were fifty-six, sixty-three, and seventy years, respectively. The reaction due to the operation was slight; there was no aphonia, no difficulty in deglutition, nor very distressing head-symptoms in any case. Slight ptosis, miosis, and decrease in tension were observed in all. A decided improvement in the acuteness and fields of vision for white and for colors was observed in each of the patients. The first patient was operated upon six weeks, the last case six days, before presentation. Although the promise of relief was great, the time elapsed was not sufficient to warrant an opinion regarding the ultimate result.

Dr. J. L. ADAMS reported a **case of tabes** that he had referred to a neurologist, who advised that sympathectomy be performed. The operation was performed recently by a surgeon who removed the superior, middle, and inferior ganglia. The patient had some throat symptoms after the operation, but Dr. Adams does not know what the result or subsequent history will be.

Dr. WEEKS stated that no unfavorable symptoms manifested themselves in his cases, outside of those referable to paralysis of the sympathetic.

DR. WEEKS IN THE CHAIR.

Dr. VALK read a short paper on **myopia.** He stated that in eyes with corneæ of short radii you find myopia; with long radii, hyperopia. The mean radius he found to be 7.65 *mm.* When he finds long radii in myopia and short radii in hyperopia, he considers the error to be purely axial myopia or hyperopia. Myopic eyes with long radii show changes at posterior part of the eyeball, while myopia with short radii show very little if any change in fundus. Cases of axial myopia always require special watching by attending surgeon. In myopia associated with imbalance of the external ocular muscles, there does not seem to be any special tendency to turn the eye in any one direction, as we have as many cases of exophoria as esophoria. He stated that he has seen myopia of 18 D, but that he never saw a case of myopia of 20 D.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE THIRD QUARTER OF THE YEAR 1901.

By Prof. ST. BERNHEIMER, at Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin;

with the assistance of

Dr. G. Abelsdorff, Berlin; Prof. E. Berger, Paris; Dr. A. N. Alling, New Haven, Ct.; Dr. Dalén, Stockholm; Dr. J. Herrnheiser, Prague; Prof. Hirschmann, Charcow; Dr. J. Jitta, Amsterdam; Dr. Krahnstöver, Rome; Mr. C. Devereux Marshall, London; Dr. P. von Mittelstädt, Metz; Prof. Da Gama Pinto, Lisbon; and others.

Translated by Dr. Ward A. Holden.

Sections I.–III. Reviewed by Professor HORSTMANN.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

351. **Lubarsch** and **Ostertag.** Advances in general pathology and the pathology of the eye in 1897–1899. Wiesbaden, Bergmann, 1901.

352. **Wilbrand** and **Saenger.** The relations of the nervous system to the lachrymal apparatus, conjunctiva, and cornea. A handbook for neurologists and ophthalmologists. Second volume of the neurology of the eye. Wiesbaden, Bergmann, 1901.

353. **Szili.** Ophthalmoscopic studies on the morphography of the optic-nerve entrance in the human eye. Wiesbaden, Bergmann, 1901.

354. **Greeff.** The eye. In the text-book of special pathology by Prof. J. Orth. IX. Lieferung, 1 Hälfte. Berlin, Hirschwald, 1902.

355. **Perlia.** Kroll's stereoscopic reading tests for the discovery of simulated unilateral amblyopia. Second improved edition. Krefeld, Hoffmann, 1901.

356. **v. Ammon.** Test cards for determining distant vision. Munich, Lehmann, 1901.

357. **Feilchenfeld.** The curative value of glasses. *Samml. Zwang. Abh. a. d. Geb. d. Augenheilk.* Edited by Vossius. Vol. iv., parts 4 and 5. Halle-a-S., Marbold, 1901.

358. **Hochheim.** On color-blindness in the railway service and the value of blue as a signal color. *Berl. klin. Wochenschr.*, 1902, No. 38.

359. **Van de Meer.** Examinations of the eyes of school children in Amsterdam in 1898. *Inaug. Dissert.*, Amsterdam, 1901.

360. **Daragan.** Six years more of ophthalmic practice in the country. *Wjest. Ophth.*, xviii., p. 404.

361. **Würdemann.** The economic value of vision. *Ann. of Ophth.*, April, 1901.

In the present volume of LUBARSCH and OSTERTAG (351) the bacteriology and infectious diseases of the eye have been discussed by Axenfeld, syphilis by Peppmüller, the relation of ocular affections to general diseases, and the diseases of the retina and optic nerve by Baas, the circulation of the lymph and glaucoma by Schoute, injuries and affections of the sclera and uvea by Grunert, and the eye diseases of animals by Koenigshoefer and Kauffmann. The concluding paper is by Heilbronner on the present status of the pathology of the so-called functional psychoses.

The second volume of WILBRAND and SAENGER (352) takes up the physiology and the pathology—the conditions of excitation, paralysis, and trophic disturbances—of the nerves of the lachrymal apparatus and the fifth nerve as related to the eye.

The ophthalmoscopic studies of SZILI (353) contain eighty-seven drawings of the disc and surrounding fundus on twenty-five plates well executed by the author after nature.

In Orth's text-book of special pathology, GREEFF (354) has done the pathology of the eye. This first part contains an excellent description of the pathology of the anterior segment of the ball.

According to HOCHHEIM (358), blue is more readily recognized by the color-blind than green, and the two colors are less readily distinguished by those with normal color-perception. So long as red and green are used as signal colors, all color-blind persons must be excluded from the railway service.

VAN DE MEER (359) examined 1673 scholars, 1575 boys and 98 girls. He found the percentage of myopia gradually increasing in the higher schools until it reached 65 per cent. The age being the same, the tendency to myopia was greater the more advanced the child was in its studies. Hyperopic eyes were relatively few and became still fewer in the higher schools. When both eyes

were astigmatic, the principal meridians were usually symmetrical in the two eyes.

DARAGAN (360) in cases of trichiasis performed usually the Watson-Junge operation. In trachoma he avoided operative procedures, except that ripe follicles were sometimes crushed with the fingers. In blennorrhœa of the tear sac, he favored extirpation. In his 410 cataract operations there was 1.2 per cent. of loss. [What is meant by loss?—ED.]

Considering the unfavorable circumstances, such as the want of an operating room, the lack of sterilization of the dressings, and observing the excellent results, one is led to ask whether many of the details that are now regarded as essential in operating might not well be omitted. HIRSCHMANN.

WÜRDEMANN (361), after an exhaustive analysis of the elements affecting the earning power in case of injury of the eye, presents a mathematical formula for the determination of damages. Numerous illustrations are appended showing its practical application. ALLING.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

362. **Sandmann.** The affections of the eye observed in pregnancy, labor, and lactation. *Münch. med. Wochenschr.*, 1901, p. 1073.

363. **Meller.** On epithelial indippings and cyst formations in the eye. *Graefe's Archiv*, lii., 3, p. 436.

364. **Schirmer.** The diagnosis, prognosis, and therapy of perforating injuries of the eye. *Graefe's Archiv*, liii., p. 1.

365. **v. d. Hoeve.** The injurious effect of β naphthalin in therapeutic doses upon the eye. *Ibid.*, p. 74.

366. **Schurygin.** Pupillary reaction from excitation of the hearing by means of the tuning-fork. *Russk. Med. Wjest.*, 1901, July.

367. **Parisotti.** Blastomycetes in ocular pathology. *Mem. et Bull. de Soc. franç d'ophtal.*, 1901, p. 298. (The presence of blastomycetes in intraocular tumors, such as choroidal sarcomas, and in trachoma and pterygium.)

368. **Bietti.** Anatomical studies of a case of congenital bilateral anophthalmus. *Ann. di Ottalm.*, xxx., 5–6.

369. **Ricci** and **Benedicenti.** The influence of fatigue and the air of tunnels on the visual function of railway employés. *Bull. della scienze med. di Bologna*, Sec. viii., Vol. I.

370. **Widmark.** The effect of strong lights upon the crystalline lens. *Hygiea*, June, 1901.

371. **Morax** and **Chaillons.** On the diagnosis of the tuberculous affections of the visual apparatus. *Ann. d'ocul.*, cxxii., p. 119.

372. **Fromberg.** The diagnostic importance of arterial pulsation in the retina. *Deutsche med. Wochenschr.*, 1901, No. 32 Ver.-Beil., p. 246.

373. **Vossius.** On hemianopic pupillary inaction. *Ibid.*, No. 31.

374. **Baquis.** The pupillary reaction as an element in the differential diagnosis between hysterical amaurosis and that due to retrobulbar neuritis. *Ann. di Ottalm.*, xxx., fasc. 1.

375. **Hellgren.** On the determination of the location of iron splinters in the eye and their removal by the electro-magnet. *Inaug. Dissert.*, Stockholm, 1901.

376. **Koster.** The use of the electro-magnet in ophthalmology. *Ned. Tydschr. v. Geneesk.*, 1901, ii., No. 4.

377. **Bauer.** Enucleation in panophthalmitis. *Corr.-Bl. f. Schweizer Aerzte*, 1901, No. 18.

378. **Nobbe.** On the use of large doses of iodine preparations in ophthalmology. *Zeitschr. f. Augenheilk.*, vi., p. 186.

379. **Ollendorf.** Experimental observations on the introduction of iodoform into the vitreous. *Ibid.*, p. 36.

380. **Ostwalt.** Further experiments in regard to intraocular disinfection by means of iodoform rods. *Ibid.*, p. 194.

381. **Campbell, D. M.** Case resembling septic meningitis and one of septic thrombosis of the cavernous sinus with exophthalmus and orbital cellulitis. Death. *Ophth. Record*, July, 1901.

382. **Dercum, F. X.** A large subcortical tumor of the occipital lobe producing right-sided hemiparesis and right homonymous hemianopsia together with Wernicke's pupillary inaction sign as a distant symptom. *Journ. Mental and Nervous Disease*, Aug., 1901.

SANDMANN (362) believes, in opposition to Szili, that retinitis albuminurica in pregnancy has a good prognosis, and that uræmic amaurosis is always recovered from. Two cases of puerperal septicæmia that he treated recovered. He has found also that neuritis during lactation has a favorable course. He was not able to discover the changes in the optic disc that Bosse observed during pregnancy.

According to MELLER (363) true cysts of the iris are either congenital or of traumatic origin. Of the latter, three types may be distinguished. The true cyst is surrounded on all sides by iris tissue. Others lie in the iris but project into the anterior chamber so that the posterior surface of the cornea takes part in their boundary. A third group belong to the iris only in so far as the iris forms a part of the limiting membrane, and are in reality cysts of the anterior chamber. According to Buhl-Rothmund, bits of epithelium carried in through a perforating wound of the cornea and lodging in the iris may give rise to these cysts. According to Stölting, the ingrowth of epithelium along the margins of a perforating wound of the cornea may be the causative moment. Meller, from a series of investigations, found that in rare cases

entering epithelial cells could give rise to the formation of true iris cysts or to cysts of the anterior chamber.

SCHIRMER (364) shows that the eye inflammations after perforating wounds of the ball are localized in one or more portions of the uveal tract or the vitreous. The inflammation may be a serous, fibrinous, or purulent uveitis. When there is an abscess in the vitreous, one finds microscopically hyperæmia and infiltration of the retina and choroid. The three forms of uveitis are not sharply differentiated. Complications, which render the prognosis worse, are to be feared when, after a wound extending into the vitreous, there is exudation into the anterior chamber and the ciliary region becomes sensitive within a few days. The prognosis is best in the serous cases when large doses of mercury are employed. Operative measures are to be postponed since they bring about recurrences of the inflammation.

V. D. HOEVE (365) saw a patient aged forty, in whom there seemed to be no reason for the development of cataract but the use of a salve employed for a skin affection. This led him to give naphthol in various forms to animals. This produced cataract and retinitis. The author describes three other cases in which, after using naphthol salve, retinitis appeared in both eyes, while only in one case was the beginning of cataract noticed.

JITTA.

When a sounding tuning-fork is brought close to the ear, SCHURYGIN (366) found a quick contraction of the pupils rapidly followed by dilatation. This reaction is more marked with large forks vibrating 256–512 times.

In a case of congenital bilateral anophthalmus BIETTI (368) found in serial sections through the orbits rudiments of the eyeballs, pigment, and uveal elements enclosed in a scleral capsule, but no traces of optic nerve or lens. Only on the left side were there traces of a ciliary ganglion. The lids, muscles, and eyebrows were small, but fairly well developed. The author believes that the eyeballs were destroyed at a fairly early fœtal age, because of the smallness of the orbits, the absence of the nerves, and the almost complete absorption of the eyeballs. In the brain the corp. genic. ext., the pulvinar, and the corp. quad. ant. were reduced in size.

KRAHNSTÖVER.

RICCI and BENEDICENTI (369) after long observation in regard to railway employés have concluded that work on the open

stretches as well as work in tunnels does not affect the vision either through fatigue or atmospheric influences.

KRAHNSTÖVER.

WIDMARK (370) believes that the cataract developing in persons exposed to strong lights is due partially to the glare and partially to the ultra-violet rays. He exposed rabbits with dilated pupils to a four-thousand candle-power arc light, first cutting off the heat with water and crystal and permitting the ultra-violet rays to go through. In mild cases he found karyokinesis and proliferation in the lenticular epithelium, and in severer cases destruction of the nuclei, breaking down of the cells, swelling of the cortical fibres with exudation among them and between them and the capsule. In control experiments in which the ultra-violet rays were absorbed by a gas and a solution of sulphate of quinine, no lenticular changes were observed even when the light used was four times as strong. DALÉN.

MORAX and CHAILLONS (371) find that inoculation experiments in cases of tuberculosis of the eye are more satisfactory if made on the guinea-pig than if made on the rabbit. Injections of tuberculin, which have become discredited on account of their unfavorable effect upon tuberculosis of the lung, may be used for diagnostic purposes when lung complications do not exist, and even favor the process of recovery in ocular tuberculosis.

BERGER.

BAQUIS (374), after describing in extenso three cases, two of acute retrobulbar neuritis and one of hysterical amaurosis, comes to the following conclusions with reference to the pupillary symptoms. 1. If the pupillary reaction is preserved, the amaurosis is of hysterical nature, as otherwise distinct lesions of two hemispheres would need to be present. 2. If reaction is wanting in a dilated pupil without other signs of paralysis on the part of the third nerve, the amaurosis here also must be hysterical, since otherwise two lesions would be necessary, one of the optic nerve and one of the anterior portion of the oculomotor nucleus of the same side. 3. If both pupils are equal, but that of the affected eye reacts only consensually with the other, there is present a retrobulbar neuritis or a mechanical compression in the posterior segment of the optic nerve. KRAHNSTÖVER.

In an extensive paper, HELLGREN (375) reports on eighty-eight cases of iron splinters in the eye observed in 1899–1900 in

the clinics of Professor Widmark and Dr. Nordenson. For diagnosis he thinks the giant magnet too dangerous to the eye, but the sideroscope of Asmus is an indispensable instrument. Frequently he has used the X-rays also, but in children who are restless the results are not always satisfactory. In ten cases both X-rays and sideroscope gave a negative result when a splinter of iron was present. The author concludes :

1. That the sideroscope and the Roentgen rays are of equal value in determining the presence of a foreign body in the eye.

2. Both of these methods permit one with equal certainty to determine the location of a foreign body in the anterior half of the ball.

3. A splinter lying in the posterior half or outside of the ball is better located by means of the Roentgen rays.

4. The Roentgen rays give more information in regard to the form and size of the foreign body, while the sideroscope allows us to judge only approximately of the size of the foreign body.

5. The sideroscope alone shows whether the foreign body is magnetic — that is, whether a magnet operation is indicated.

Most of the 88 cases were operated on with the Hirschberg magnet, the giant magnet being used in 13 only.

Of 60 cases operated on with the Hirschberg magnet when the splinter was in the posterior half of the eye, extraction was accomplished in 43 cases (71.7 %), with the following results :

1. Complete or useful vision in 19.
2. Light perception in 10.
3. Normal form of the ball but no light perception in 4.
4. A somewhat atrophic ball in 2.
5. Enucleation later for cyclitis or panophthalmitis in 6.
6. Enucleation later for sympathetic ophthalmia in 2.

In the 17 cases in which extraction was not successful, the cause lay in 6 cases in the fact that the walls of the eye had been perforated a second time.

In an experimental part of his paper the author discusses, among other subjects, the best proceeding with the giant magnet, and he concludes, in agreement with Tuerk, that the current should be controlled with a rheostat, and that extraction from the vitreous is the less dangerous, the greater the distance of the magnet from the eye. Under these conditions the strong magnet is the best. DALÉN.

KOSTER (376) examined a blacksmith who stated that a piece

of steel had flown into his eye. There was a small wound in the left lower lid, and a bubble of air was seen in the anterior chamber, but no injury of the iris or lens.

The movement of the Hirschberg magnet before the eye caused no pain; and the introduction of the magnet into the eye, and even into the vitreous, after a small iridectomy, produced no result.

After cicatrization the patient left the clinic with normal vision, but the condition gradually grew worse, and three months later enucleation was done. The eye contained a splinter of iron, 4 *mm* long and 1 *mm* broad, which lay fast in the sclera.

This case led the author to some comparative observations on the value of the Hirschberg and Haab magnets, which showed how little effect the Hirschberg magnet has at a distance.

JITTA.

BAUER (377) reported 53 cases of panophthalmitis, in which enucleation was done in the Zurich clinic. In almost every case the trouble was due to an injury. The average duration of the affection from the injury to the enucleation was seven days. All healed well, without being complicated with meningitis. The utmost antiseptic precautions must be taken and the conjunctiva left unsutured to permit the escape of secretions.

OLLENDORF (379) introduced iodoform in the shape of Wüstefeld's tablets into the vitreous of three rabbits. Following this there developed in the vitreous connective-tissue bands, which caused more or less complete detachment of the retina. After the introduction of pure iodoform powder, 40–70 g., the vitreous became cloudy for a time, and after a few weeks became perfectly clear again. Haab's rods had the same effect as Wüstefeld's tablets. Pure iodoform, however, remains without causing irritation in the rabbit's vitreous, and is absorbed.

OSTWALT (380) introduced little rods of iodoform into the anterior chamber of a rabbit's eye. Some time later he opened the corneal wound and injected a highly virulent culture of staphylococcus or streptococcus. In eyes so treated there was transient irritation, and also purulent conjunctivitis, while eyes that had not been treated with iodoform suffered from corneal suppuration after the injection.

The first case reported by CAMPBELL (381) was in a girl of twelve, who, after the rupture of a small pustule on the right side of the forehead, developed a chill and temperature of 106°, pulse 160,

with delirium. There was great exophthalmos and œdema of the lids. No pus was found by incisions into the orbital cavity. The child died in coma forty-eight hours after the initial chill. The second case, after having a small pustule on the cheek, showed exophthalmos in both eyes. The characteristic temperature curve, chills, and sweats determined the case to be one of septic infection. Incisions evacuated large quantities of pus and necrotic tissue. Patient died of general septic infection.

ALLING.

III.—INSTRUMENTS AND REMEDIES.

383. **Pflueger, E.** Subconjunctival injections of hetol. *Arch. d'opht.*, xxi., 7, p. 399.

384. **Kirschner.** On the use of aspirin in ophthalmology. *Ophth. Klinik*, No. 18, 1901.

385. **Remy.** A diploscope. *Rec. d'opht.*, 1901, No. 7.

386. **Guillaume.** Presentation of Dr. Berger's plastoscope. *Bull. de la soc. franç. de physique*, 1901, No. 164.

387. **Thorner.** Demonstration of a stereoscopic ophthalmoscope. *Berl. klin. Wochenschr.*, 1901, No. 38.

388. **Oliver.** A series of demonstration lenses intended for teaching purposes. *Annals of Ophth.*, April, 1901.

389. **Weeks.** Bifocal lenses; what area should be devoted to the shorter focus. *Med. Record*, Aug. 24, 1901.

390. **Oliver.** Simplified form of stereoscope. *Ophth. Record*, August, 1901.

PFLUEGER (383) tried subconjunctival injections of hetol in a large number of cases of disease, particularly of the anterior segment of the eye, such as deep keratitis and iritis, and was pleased with the results, particularly in a case of tuberculous iritis. One per cent. solutions are injected on alternate days, followed by massage. No bandaging is necessary. MITTELSTÄDT.

KIRSCHNER (384) used aspirin with good results in rheumatic iritis, and in cyclitis and irido-cyclitis of various origins, and in headache. The remedy is to be recommended, since it has not the unpleasant effects of salicylate of soda.

REMY (385) describes under the name of diploscope an ingenius apparatus, in which one thinks he sees a number of letters with both eyes simultaneously, while in reality only some of the letters are seen with each eye. Remy uses the diploscope to detect simulation, to diagnose functional disturbances of the ocular muscles, and in the determination of refraction in anisometropia.

BERGER.

The plastoscope of Berger (386) is used to give to the observer an effect of relief from a flat picture. By means of this instrument simulators may be discovered quickly, because in reality the part of the picture that the observer believes he sees with his right eye is seen with his left, and vice versa.

BERGER.

A set of sixteen pieces, for the purpose of illustrating the use of lenses, has been devised by OLIVER (388). Every lens and prism has the same strength and size. ALLING.

WEEKS (389) advocates oval "pasters," 10 *mm* in the vertical diameter, and 15 in the horizontal, and about 2 *mm* above the lower edge of the distance lens. The wearer can thus see objects below through the distance glass. ALLING.

Sections IV.–VII. Reviewed by DR. ABELSDORFF, Berlin.

IV.—ANATOMY.

391. **Leber.** A supplementary note to Prof. Hosch's paper on the epithelium of the anterior capsule of the lens. *Graefe's Archiv*, lii., 3, p. 488.

392. **Noll.** Morphological changes in the lachrymal gland in secretion. *Archiv f. mikros. Anatomie*, lviii., p. 487.

393. **Vaschide** and **Vurpas.** On the histological constitution of the retina in the absence of the brain. *Compt. rend. de l'acad. d. sciences de Paris*, July 29, 1901.

394. **Johnson, Lindsay.** The comparative anatomy of the mammalian eye. *Philosophical Transactions of the Royal Society*, 1901, pp. 82, and 30 plates.

NOLL (392) studied the changes occurring in the lachrymal gland of the cat during secretion, due to excitation of the lachrymal nerve or the injection of pilocarpine. He found that the secretion was contained in the cells of the gland in the form of drops which passed from the base to the distal end of the cells, and were thrown off, the cells losing much in volume by the process.

VASCHIDE and VURPAS (393), in a case of anencephalus, found the retina completely developed, from which they concluded that at the time of the formation of the primary optic vesicle the brain was normally developing, and was probably destroyed later by an inflammatory process. BERGER.

LINDSAY JOHNSON (394) has presented in this publication of the Royal Society the results of observations, mostly ophthalmoscopic, made in the course of many years, on the eyes of a

great number of mammals. The difficulty of the undertaking will be recognized by every one who has used the ophthalmoscope on animals, and Johnson has studied not only tame animals, but wild ones as well. Besides the fifty-two colored drawings of the fundus, there are plates representing: (1) various types of persistent hyaloid artery; (2) rudiments of the pecten and hyaloid artery in mammals; (3) supplementary formations on the iris of the ungulates; and (4) a graphic representation of the varying divergence of the visual lines in the different mammalian orders.

Since we cannot here enter deeply into the matter of the value which the ocular conditions have as respects classification in systematic zoölogy, the following facts of general ophthalmological interest may be mentioned:

The color of the mammalian fundus is either red (as in the monkey, etc.), or yellow (as in the elephant), in the most varied nuances of these colors, or greenish (as in most carnivora).

The color of the disc ranges from black, through green, red, and yellow to white. A physiological excavation is found in all the felines; and medullated fibres are frequent, particularly in the rodents and marsupials. A persistent hyaloid artery is found in almost all ruminants and many rodents, and in some of the latter are formations similar to the pecten of birds.

The nictitating membrane diminishes as one ascends the mammalian scale, and is found most highly developed in the ungulates, in which there is often ectropium uveæ with excrescences.

The higher in the scale the nearer parallel the visual lines, which is an advantage possessed by the higher apes and man. Only these are able to converge to any degree, and only these possess a macula, so that parallelism of visual lines, power of convergence, and differentiation of a circumscribed portion of the retina to form a macula go hand in hand.

Of pathological interest are the facts that domestic animals develop myopia, which is not found in wild animals, and that in some apes which are active at night continued exposure causes the normal peripheric retinal pigmentation gradually to extend toward the disc and the animal to become blind.

V.—PHYSIOLOGY.

395. **Lodato.** On the alterations in the ciliary ganglion, following section of its roots. A contribution to the nature of the ciliary ganglion. *Arch. di Ottalm.*, viii., 5, 6.

396. **Carter, Brudenell.** The cultivation of distant vision. *Lancet*, June 8, 1901.

397. **Howe.** On the measurement of the intraocular base line and the size of the meter-angle. *Ann. of Ophth.*, July, 1891.

LODATO (395) resected in dogs the oculomotor trunk on the base of the skull, extirpated the superior cervical ganglion, and destroyed completely the Gasserian ganglion. In this way the effect was obtained of dividing the roots of the ciliary ganglion, yet without producing a lesion in its immediate neighborhood. A preceding careful examination of the cellular elements of the ciliary ganglion, the Gasserian ganglion, and the superior cervical ganglion revealed no uniformity of cell forms; but the cells of the ciliary ganglion, as regards size, form, and arrangement of chromatic granules, had individual characteristics, so that a conclusion as to the sympathetic or the spinal origin of the ganglion did not appear justified.

After extirpation of the superior cervical ganglion, very marked changes were observed in a number of the cells of the ciliary ganglion, the large round and oval cells undergoing atrophy and necrobiosis. Furthermore, all the cells in the accessory groups of ganglion cells were always changed in high degree.

After destruction of the Gasserian ganglion well marked changes appeared early in the cells of the same type as those affected after extirpation of the superior cervical ganglion. The accessory groups, however, remained unchanged or were but slightly altered.

Unchanged also were in the former experiments the cells of the ciliary ganglion, which were distinguished from the large oval cells by their small size and their small number. They appeared greatly changed, however, after the intracranial section of the common oculomotor. Thus the sympathetic character of these cells is excluded, although examined histologically by Nissl's stain and compared with cells of the superior cervical ganglion, one might mistake them for cells of the sympathetic system.

None of the operations was followed by changes in the ciliary nerves.

These experiments lead the author to believe that the ciliary ganglion is of mixed character, its proper cells being chiefly of spinal character, while the accessory groups of cells are mainly sympathetic. KRAHNSTÖVER.

BRUDENELL CARTER (396) has asserted that as the result of examining a number of town and country children he has come to

the conclusion that the former cannot see so well at a distance as the latter, and this he attributes to the fact that town children are always looking at comparatively near objects and hardly ever look at far distant objects. Also we now hear much of the keen sight of the Boers as compared with English soldiers. The reason of this is not that the eyes of one nation are better than the other, but that in the clear air of South Africa the Englishman is liable to misjudge his distance simply because he has not been trained to do so under the conditions met with out there. The same applies to seeing small objects and slight movements at a distance. Mr. Carter recommends that the sight of children should not only be carefully tested, but that they should be trained to appreciate slight movements and small objects a long way off. This is partly a mental and partly an ocular education. In this way the distant vision may be greatly improved.

HOWE (397) has devised two methods for the measurement of the intraocular base line, and emphasizes the need and importance of such aid in determining the meter-angle and relative accommodation. A table is presented, by means of which, knowing the length of the base line and the distance of the object, the meter-angle can at once be read off. ALLING.

VI.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

398. **Heine.** A fourth report on the anatomy of the myopic eye. *Arch. f. Augenheilk.*, xliv., 66.

399. **Gaupillat.** Subjective myopia of five dioptries in the eye of a person aged sixty, which objectively was emmetropic. *La clin. ophth.*, 1901, p. 265.

400. **Senn.** A contribution to the operative treatment of high myopia. *Arch. f. Augenheilk.*, xliii., p. 241.

401. **Ricchi.** A contribution to the study of diffusion circles. *Ann. di Ottalm.*, xxx., 1.

402. **Lobanoff.** On seeing in diffusion circles and on aphakic accommodation. *Wjest. Ophth.*, July–October, 1901.

HEINE (398) found in five myopic eyes, four of which had been examined in life, that the choroidal tissue in the area of the conus was present in an atrophic condition. This atrophy is produced by the fact that the lamina elastica is stretched relatively little and the nerve fibres, which consequently undergo a folded distortion, suffer a pressure atrophy.

Heine does not find that the stretching of the myopic eye leads to a separation of the neuro-epithelial elements in the fovea.

The flattening of the fovea found in an eye of — 12 D was due not to a separation of the neuro-epithelial elements but to a stretching of the inner layers of the retina.

VII.—MUSCLES AND NERVES.

403. **Marie.** Bilateral ptosis in a patient with myopathia facio-scapulo-humoralis. *Ann. d'ocul.*, cxxvi., p. 57.

404. **Delbès.** Two cases of congenital ptosis operated on by Motais's method. *La clin. ophth.*, v., p. 259.

405. **Feilchenfeld.** On single vision in cases of congenital paralysis of the ocular muscles; according to investigations on a case of complicated abducens paralysis. *Zeitschr. f. Augenheilk.*, vi., 3, p. 198–203.

406. **Landolt.** The technic of muscular advancement. *Arch. d'opht.*, xxi., p. 369–378.

407. **Harlan.** Myosis and ptosis from paralysis of the cervical sympathetic by gunshot wound. *Ann. of Ophth.*, April, 1901.

408. **Stillson.** Nerve resection as applied to the supraorbital and naso-lachrymal branches of the fifth pair. *Am. Journ. of Ophth.*, Aug., 1901.

409. **Veasey.** Report of a case of complete right oculomotor and complete left trifacial paralysis. *Phil. Med. Journ.*, July 13, 1901.

410. **Heard.** Hereditary binocular ophthalmoplegia. *Ophth. Rec.*, Aug., 1901.

FEILCHENFELD'S (405) patient, a woman of eighteen, showed general congenital hypoplasia of the left eye, including the muscles. Mobility was limited in all directions, and there was complete paralysis of the abducens, with secondary contracture of the internus and also vertical deviation due to paralysis of the trochlearis. The vertical deviation appeared when she fixated distant objects, while when the object of fixation was brought nearer the left eye suddenly turned down. The latter phenomenon found its explanation in the righting influence of the tendency to fusion, the deviating eye taking part in central fixation in near vision, and thus in the interest of binocular single vision the vertical deviation is overcome.

LANDOLT (406) distinguishes simple advancement of the muscle from advancement with resection, to which he attributes a greater effect. He sutures the divided muscle with the overlying tissues to the conjunctiva and episclera, and considers necessary the immobilization of both eyes by a bandage after the operation. In cases of convergent strabismus the accommodation is simultaneously paralyzed with atropine, and glasses correcting the hyperopia are put on immediately after the removal of the bandage.

Taking off the glasses later will correct an excessive effect of the operation.

STILLSON (408) presents a number of cases of severe neuralgia permanently relieved by resection of the supraorbital and naso-lachrymal nerves. ALLING.

VEASEY (409) believes his case to have been due to cerebro-spinal syphilis with meningeal involvement at the base, probably most marked in the interpeduncular space and over the pons and involving principally the right oculomotor and left trifacial. ALLING.

HEARD (410) relates a case of binocular ophthalmoplegia in which the father, brother, two sisters, and two sons were afflicted with the same condition. ALLING.

Sections VIII.–XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

411. **Fage.** The treatment of blepharitis with picric acid. *Mém. et bull. de la soc. franç. d'opht.*, 1901, p. 437.

412. **Dupuy-Dutemps.** Palpebro-palpebral autoplasty with a pedicle in the treatment of cicatricial ectropium of the lower lid. *Arch. d'opht.*, xxi., 9, p. 518.

413. **Terson.** Palpebro-palpebral autoplasty in cicatricial ectropium of the lower lid. *Bull. de la soc. d'opht. de Paris*, July 2, 1901.

414. **De Berardinis.** Endothelial sarcoma of the upper lid extending to the bulbar conjunctiva. *Ann. di Ottalm.*, xxx., 1.

415. **Scalini.** Palpebral carcinoma of Meibomian origin. *Ibid.*, xxx., 1 and 2.

416. **Schapringer.** A case of congenital coloboma of the upper lid. *N. Y. med. Monatschr.*, xiii., 6, p. 257.

FAGE (411) recommends in blepharitis the use of picric acid (0.8–1 %) in glycerine or an alcoholic solution of gum. Picric acid acts as an analgesic, an antiseptic, and a keratoplastic. Recovery takes place quickly. The yellow color of the ciliary margin disappears twenty-four hours after the use of the acid. BERGER.

DUPUY-DUTEMPS (412) recommends in cases of cicatricial ectropium of the lower lid the turning of a flap from the upper lid on a pedicle above the outer commissure and implanting it in the lower lid. The cosmetic result is good. v. MITTELSTÄDT.

The detailed clinical and pathological description of SCALINI's (415) tumor of the upper lid leaves no doubt but that it was an

epithelioma arising from the epithelium of the Meibomian glands. Of seven cases reported, he regards only those of Salzmann and Grósz as unquestionable. (See also report of cases by Knapp and Mills. These ARCHIVES, XXX., p. 309, 1901.—TRANS.)

KRAHNSTÖVER.

IX.—LACHRYMAL APPARATUS.

417. **Anargyros.** A case of initial lesion of the lachrymal gland. *Beiträge z. Augenheilk.*, 48, p. 96.

418. **Schoute.** A supernumerary canaliculus. *Ned. Tydschr. v. Geneesk.*, 1901, 2, No. 8.

419. **Raehlmann.** On trachomatous dacryocystitis and on the cause of acute dacryocystitis. *Deutsche med. Wochenschr.*, 1901, No. 43, p. 747.

ANARGYROS (417) reports the case of a patient of fourteen in whom a tumor of the lachrymal gland was regarded as tuberculous and extirpated. The conjunctival wound healed smoothly, as did also the wound after extirpation of the pre-auricular glands. There then appeared in the inferior cul-de-sac numerous prominent grayish-white nodules which disappeared after being treated with 2-per-cent. silver solution. Some weeks later he was surprised to find a skin eruption with other secondary symptoms of syphilis. The extirpated tumor contained in fact both the gland and the primary sore. How the infection was acquired, and how, being acquired, the conjunctiva was not involved, it was impossible to say.

Besides SCHOUTE'S (418) case there are on record twenty-two cases in which a person had a third canaliculus. Schoute's patient had a chronic conjunctivitis with moderate epiphoria. The supernumerary canaliculus was then discovered opening behind the caruncle. The possibility of its being a capillary fistula could be ruled out because there had never been dacryocystitis. Schoute cauterized this canaliculus several times without result. After the use of sounds was discontinued for some time, the epiphora ceased, as the chronic conjunctivitis was cured.

RAEHLMANN (419) has found that an acute dacryocystitis practically never can develop from the usual chronic affections of the mucosa of the sac. An acute process is not an affection of the mucosa but a suppuration of the submucous tissue, which may arise from a periostitis or erysipelas, but cannot be regarded as the product of a chronic suppuration of the mucosa, in the author's opinion, unless there is some special connection between the two

processes. The ordinary superficial defects in the mucosa do not give access to the submucosa. Such communications the author has found clinically and pathologically only in dacryocystitis trachomatosa, which, like conjunctival trachoma, leads to deep ulceration of the follicles.

X.— ORBIT AND NEIGHBORING CAVITIES.

420. **Lass.** A case of bilateral orbital phlegmon ending in recovery. *Deutsch med. Wochenschr.*, 1901, No. 31, Vereinsbeilage, p. 238.

421. **Vauzetti.** Primary glioma of the orbital cavity. *Ann. di Ottalm.*, xxx., 1.

422. **Gruner.** A case of pulsating exophthalmus. *Finska Läkaresällsk. Scand.*, July, 1901.

423. **Bossalino.** A case of pulsating exophthalmus associated with Basedow's disease. Recovery. *Ann. di Ottalm.*, xxx., 2.

424. **Ercklentz.** Pulsating exophthalmus caused by orbital encephalocele. *Klin. Monatsbl. f. Augenheilk.*, xxxix., p. 755.

425. **Bergmeister.** On congenital enophthalmus. *Beiträge z. Augenheilk.*, xlviii., p. 37.

426. **Gallet** and **Coppez.** A case of giant osteoma of the sphenoidal sinus. *Arch. d'opht.*, xxi., 9, p. 497.

427. **Trombetta.** Angiosarcoma of the frontal sinus. *Ann. di Ottalm.*, xxx., 3.

428. **Schwenk.** Exophthalmus, the result of osteoporosis. *Annals of Ophth.*, April, 1901.

429. **Hoople.** A nasal condition affecting the ocular muscles. *Med. News*, July 27, 1901.

430. **Suker.** On the employment of agar-agar in the formation of a stump after enucleation or evisceration. *Ophth. Record*, Sept., 1901.

The orbital tumor observed by VAUZETTI (421) was composed exclusively of cells round, or nearly so, with delicate processes, in all respects similar to neuroglia cells. No connective tissue was found, but neither were ganglion cells or other nerve elements present. There were no foci of degeneration.

The author believed the tumor due to glia elements that had been carried into the orbit in fœtal life.

GRUNER'S (422) patient, a woman of thirty, had severe vomiting at the time of menstruation. Suddenly severe pain began in the left side of the head, and a protrusion of the left eye was noticed.

At the examination a well-marked pulsating exophthalmus was found. On the fourth day the common carotid was ligated, and death followed five days later. At the autopsy, the region of the

cavernous sinus was found to be greatly infiltrated with blood, and the wall of the carotid was thin. A rupture could not be discovered on account of the excessive infiltration with blood. There was nothing abnormal in the orbit. DALÉN.

BOSSALINO's (423) case of pulsating exophthalmus was of traumatic nature, apparently in consequence of rupture of the internal carotid into the cavernous sinus. Since the patient had suffered some years before with slight exophthalmus, tachycardia, and swelling of the neck, Basedow's disease was thought to be the cause of the diminished resistance of the vessel walls.

KRAHNSTÖVER.

ERCKLENTZ's (424) patient had a congenital and an acquired heart lesion. The exophthalmus had existed since childhood and in recent years had increased and pulsation become noticeable. Anatomically it was found that there was a defect in the posterior wall of the orbit, which brought the eyeball into communication with the brain in the middle fossa, and thus brought about the pulsation. Mulder had suggested that this condition might exist, and Wiedermann found it once at an autopsy.

BERGMEISTER's (425) patient, a woman of eighteen, had had unilateral enophthalmus since birth, with microphthalmus and coloboma of the choroid, and faultily developed bones and muscles of the same half of the face. When an attempt was made to relieve the enophthalmus by tenotomizing the four recti, no muscle was found, there being only tendinous, unelastic bands, section of which did not alter the position of the eye. The retraction may have been caused by the optic nerve.

The giant osteoma of the frontal sinus, operated on by GALLET and COPPEZ (426), appeared five years before as an orbital tumor, apparently springing from the frontal sinus. As the tumor grew it broke through the lower lid, forming an ulcer, and later a fistula, through which a sound, introduced 6 *cm*, struck upon a hard wall. In the naso-pharyngeal space to the right side there was a protrusion. The eye, which very early showed a neuritic atrophy, was entirely blind. The operation began with a tracheotomy, after which the right common carotid was exposed and a loop thrown about it, but not tightened, because the temporary resection of the superior maxilla, which was undertaken next, led to little hemorrhage. The eye was then enucleated, and an ivory hard tumor as large as a hen's egg was removed. It sprang from

the sphenoidal sinus, which contained pus, filled a portion of the orbit, and, after breaking through the roof of the orbit, entered the frontal sinus.

For ten days the patient did well, then, through infection from the sinus, a purulent basilar meningitis was set up, and death ensued. The authors describe in detail the technique of the operation, and suggest the question whether, in order to prevent the danger of infection, the permanent resection of the superior maxilla would not be more advisable. They discuss the symptoms of osteoma of the sphenoidal sinus, and call attention to the early disturbances in vision from compression of the optic nerve in the optic canal. v. MITTELSTÄDT.

TROMBETTA'S (427) case of angiosarcoma of the frontal sinus is interesting, both on account of its rarity and because the symptoms all pointed to empyema of the sinus. The author believes that there had been a primary acute inflammation of the frontal sinus synchronous with the development of the tumor, and closure of the infundibulum through the tumor led to the empyema.

KRAHNSTÖVER.

SCHWENK (428) relates the case of a man, thirty-three, who, fifteen years before, had been struck by a base-ball bat on the right lower jaw. Slow osteoporosis of the bones of the face had been in progress since that time. The involvement of the eye consisted in a gradual expulsion of the eyeballs and surrounding tissues from the orbital cavities. The optic nerves were in a state of almost complete atrophy, the effect of stretching and pressure. The vision in each eye was reduced to one fortieth of the normal.

ALLING.

HOOPLE (429) believes that pressure of the middle turbinate against the septum can cause impairment of the efficiency of the ciliary and external muscles. He cites a number of cases of asthenopia cured by the treatment of the nasal conditions.

ALLING.

SUKER (430), after numerous experiments, concludes that the various absorbable media introduced into the scleral or capsule cavity for the purpose of producing a more prominent stump after enucleation always yield only temporary results. Agar-agar offers no exception.

ALLING.

XI.—CONJUNCTIVA.

431. **Petit.** Metastatic ophthalmia of the left eye, serpent ulcer of the right. Bilateral conjunctivitis due to the pneumococcus in a patient with pneumonia. *Ann. d'ocul.*, cxxvi., p. 186.

432. **Straub.** The retrotarsal folds in trachoma. *Ned. Tydschr. v. Geneesk.*, 1901, ii., p. 4.

433. **Blumenthal.** Some new observations in regard to the treatment of trachomatous affections of the conjunctiva and cornea. *Beiträge z. Augenheilk.*, 47, p. 108.

434. **Hoppe.** Is trachoma a disease of early childhood? *Klin. Monatsch. f. Augenheilk.*, xxxix., p. 523.

435. **Bailette.** On the use of itrol in some forms of trachoma. *La clin. oculista*, 1901, p. 575.

436. **Jitta.** Statistics in regard to the trachoma endemic in Amsterdam. *Ned. Tydschr. v. Geneesk.*, 1901, ii., No. 10.

437. **Scheffels.** A contribution to the question of the efficacy of Kuhnt's method of transplantation of the conjunctiva. *Klin. Monatsch. f. Augenheilk.*, xxxix., p. 751.

438. **Monesi.** On a case of hyaline degeneration of the conjunctiva. *Arch. di Ottalm.*, viii., 7–8.

439. **Schmidt-Rimpler.** Multiple cyst formation of both lower retrotarsal folds in chronic peripheric furrow keratitis. *Münch. med. Wochenschr.*, 1901, No. 37.

440. **Scalinci.** Primary epithelioma of the tarsal conjunctiva. *Ann. di Ottalm.*, xxx., 3.

441. **De Berardinis.** Epibulbar melanosarcoma. *Ann. di Ottalm.*, xxx., 4.

442. **Puccioni.** Epibulbar sarcoma, a clinical and pathological contribution. *Bull. della R. Accad. Med. d. Roma*, xxvi., 7–8.

443. **Berl.** On tumor formation on the caruncle. *Beiträge z. Augenheilk.*, 47, p. 63.

444. **Hansell.** A case of tuberculosis of the conjunctiva. *Annals of Ophth.*, July, 1901.

445. **Levy, A.** A case of conjunctival tuberculosis, with peculiar onset, ending in spontaneous healing. Report of a case from the University Eye Hospital, Rostock, Germany. *Ophth. Record*, July, 1901.

446. **Risley and Shumway.** Carcinomatous degeneration of a papilloma of the conjunctiva with infiltration of the eyelids. *Annals of Ophth.*, July, 1901.

447. **Sherer.** Conjunctivitis from X-rays. Incipient retinitis apparently due to the same cause. Report of a case. *N. Y. Med. Journ.*, Sept. 21, 1901.

STRAUB (432) in trachoma finds almost constantly a longitudinal scar on the upper tarsus. According to him this scar comprises the entire tarsal conjunctiva, while the conjunctiva that in these cases unites the tarsus with the bulbar conjunctiva is composed entirely of conjunctiva from the retrotarsal fold.

Straub recognizes the difficulty of proving his hypothesis, but he has observed three cases in which the portion of the conjunctiva which connects the upper portion of the tarsus was loose, as it never is in the normal state. JITTA.

BLUMENTHAL (433) treats particularly of the indications for excising the conjunctiva, which he believes exercises an absorbent effect upon the growths in the conjunctiva at a distance and on the pannus, wherefore the operation should be extensive. An existing slight ptosis seems sometimes to be increased and sometimes diminished by this procedure. Excessive pannus should be removed. In cases of corneal infiltration eserine is of service, and mercurial inunctions if there is an iritis at the same time. In conclusion he speaks of a case of trachoma cured by an intercurrent conjunctival infection with the gonococcus which unfortunately destroyed the cornea.

HOPPE (434) does not accept Straub's opinion that trachoma is a disease of early childhood and that school-children do not require careful isolation since they have become more or less immune. With us there is not a decrease in trachoma during the period of school life. The author examined the entire population of some districts in East Prussia and found trachoma in 6 % of those under 6 years of age, 13 % in those between 14 and 21 years, and an average of 8 % in those above 21.

JITTA (436) finds that trachoma in Amsterdam is, as elsewhere, almost exclusively a disease of the Hebrew poor. The first statistics of trachoma in the Amsterdam schools date from the year 1880, the second from 1897, while Jitta in 1900–1901 examined the pupils of 12 public and one private school, in all 4250. Three fourths of the pupils were Hebrews as in the previous years. The relative figures were:

In 1880	35.5 %	affected with trachoma.
In 1897	15.6 %	" " "
And in 1900–1901	7.8 %	" " "

The improvement is most noticeable in the schools for young children. Thus a private Hebrew primary school with 700–800 pupils had in 1888 65 %, and in 1901 only 13.7 % of trachoma cases. Comparing the number of trachoma patients in the various classes, Jitta finds that the percentage increases 1 % regularly with each higher class. The cause of this lies in the fact that the number of trachoma cases among the children who have not yet been

sent to school decreases from year to year, so that each year the number of trachoma cases in the lowest class becomes less.

JITTA.

Since many ophthalmologists have not expressed a high opinion of transplantation of conjunctiva, SCHEFFELS (437) reports three new favorable cases. The first was one of healing of a staphyloma for which iridectomy had been done four or five years before, and after a fresh bulging of the cystoid scar an ulcer with hypopyon appeared. After cauterization a fistula remained, which with the incarcerated iris was cut out. The 4-*mm* wide perforation so left was covered with a conjunctival flap. In a second similar case a diagnosis was made of irido-cyclitis with infiltration of the vitreous with hypopyon 4 *mm* high proceeding from a cystoid scar in the sclera. The intraocular infection was cured promptly after transplantation. In the third case an ulcer occupied two thirds of the cornea and at certain points passed deeply into the cornea. The margins were not undermined. The infiltrated base was pencilled off and covered with a large flap which united and as the cornea was restored was thrown off so that but slight opacity of the cornea resulted.

The case of hyaline degeneration of the conjunctiva observed by MONESI (438) showed a new growth 1 *cm* broad and several *mm* thick arising from the upper fornix and projecting downward like a nictitating membrane. The tumor was as hard as cartilage, of uneven surface and yellowish color, with some fine blood-vessels on its surface. Staining reactions revealed its hyaline character.

KRAHNSTÖVER.

SCHMIDT-RIMPLER (439) presented a patient with a series of cysts of the conjunctiva close behind the orbital edge of the tarsal portion. These little cysts were probably due to degeneration of the acino-tubular glands of Krause.

In the same patient Schmidt-Rimpler demonstrated his peripheric chronic furrow keratitis, which he identified with the marginal sclerosis and marginal atrophy of the cornea, recently described by Fuchs. Centrally from the furrow was an arcus senilis, and peripherally from it also a gray opacity from which small dots passed into the furrow.

In SCALINCI'S (440) case the tumor extended deep into the tarsus, offering to superficial observation the picture of chalazion, but proving to be undoubtedly an epithelioma.

KRAHNSTÖVER.

DE BERARDINIS (441) observed two cases of melano-sarcoma arising from the limbus. One proved to be very rich in giant cells and the other consisted of round and spindle cells. One of the tumors had developed from a spot of pigment at the limbus. Pigment was found to lie not only in the body of the cell but also in the nucleus. There being no grounds for believing the pigment to be of hematogenous origin, it was believed to be due to proliferation of the pigment in the original spot.

KRAHNSTÖVER.

PUCCIONI (442) reports a case of epibulbar tumor which was removed with preservation of perfect vision, and proved to be a spindle-celled sarcoma. KRAHNSTÖVER.

In a man of forty-seven BERL (443) found in the caruncle of an eye, otherwise healthy, a congenital cystic tumor 1 *cm* in diameter, whose inner wall contained hair follicles and was covered with many layers of epithelium, whence it was diagnosed as a dermoid.

Two other tumors of the caruncle are described: one an angioma, the other a melano-sarcoma. The angioma was found in a patient of eighteen. It had grown rapidly from a pin-head size to a diameter of 1 *cm*. It was pedunculated and bled readily. Apparently it had partly undergone mucoid degeneration. The melano-sarcoma was seen in a patient aged seventy-two. It was 2 *cm* in diameter, taking the place of the caruncle, and extended in the conjunctiva to the fornices and to the puncta. The preauricular gland was melanotic.

HANSELL'S (444) case was a healthy child, three years old. He found on the temporal side of the ocular conjunctiva a partly circumscribed patch of inflammation, in the centre of which were several small nodules. On excision, the sections showed a central area of necrotic tissue, which was surrounded by mononuclear cells with epithelioid and giant cells. In spite of the fact that no tubercle bacilli were found and no inoculations were made the diagnosis seemed justified from the clinical and microscopical evidence. ALLING.

LEVY (445) relates the case of a child of three years who had suffered from abscesses of the right submaxillary glands. There appeared a cohesive white membrane on the greater part of the conjunctiva of the right lower lid. This could not be stripped off. A diagnosis of diphtheria was made, but there was no reaction to anti-diphtheritic serum and no bacteria were found in the cultures.

In the course of two weeks the pseudo-membrane slowly disappeared, leaving a large ulcer on the conjunctiva of the lower lid. This was surrounded by small yellow tubercles, and proved to be tuberculous both by the microscopic examination and inoculation of the rabbit. The ulcer entirely healed. ALLING.

The case of RISLEY and SHUMWAY (446) proves the possibility of the conversion of a papilloma into a malignant growth, in the sense of destroying surrounding tissue — a fact denied by the majority of writers. ALLING.

SHERER'S (447) patient had been exposed to the X-rays almost every day for three years. He developed desquamative dermatitis, with the characteristic tanning or bronzing of the skin. There was almost complete loss of the eyelashes and eyebrows. He suffered from conjunctivitis, the optic nerve was hazy, and the fundus congested. When protected from the X-ray by a shield of steel and glass the condition above described disappeared. ALLING.

(*To be continued.*)

BOOK NOTICES.

VII.—**Anomalies of Refraction and Diseases of the Eye.** By Dr. FLAVEL B. TIFFANY, Kansas City, Missouri.

This volume, of about six hundred well-printed pages, contains, in the first half, a very well-sketched and interesting account of the anomalies of the refraction of the eye, together with a full description of the various methods for testing and treating such defects with lenses. Heterophoria, with its methods of discovery and treatment by exercises and tenotomies, is included in the second part, together with a voluminous account of the diagnosis, pathology, and treatment of injuries and diseases of the eye and its appendages. The most attractive feature of the work is the abundance of the illustrations, the majority of the half-tones from photographs of living patients being truly remarkable in their uniform excellence, and most effective for clinical instruction or for refreshing the memory of the busy medical man. Amongst the best of these we may mention those of trachoma, chalazion, gonorrhœal conjunctivitis, coloboma iridis, and extraction of cataract, all of which leave nothing to be desired. Many of the microscopic slides are excellently reproduced. Unfortunately, the wood-cuts, scattered freely about, are coarsely done, the spongy nature of the paper employed, perhaps, being most at fault. The numerous ophthalmoscopic pictures are inferior, too much and too yellow a pigment having been employed.

This book is remarkable in the attention paid to the **treatment** of diseases, the author showing himself thoroughly posted in the very latest methods of this most useful division of medical practice. From this point of view Tiffany's book is masterly.

We regret to observe the use of such phrases as "anchylosis of the eye with strangulation of the eyeball," or "removing corruption from the eye," or of "explosives knocking out hundreds of eyes every Fourth of July."

The book is accompanied with a useful glossary of terms employed in ophthalmological nomenclature, and a most copious and trustworthy index. But we are compelled to call attention to the omission of pagination when references are made to other portions of the work. Thus, in the chapter on glaucoma, we are referred, for the performance of iridectomy, to the chapter on the iris. In order to find that, we turn to and fro without any idea where to look, whereas the use of "page 323" in brackets would have put us at once on the spot. So, too, with instruments, which, in order to discover, need careful search, when pagination of the instrument would have saved us time. This is a crying fault in modern books. Again, in the index, we have to deprecate the use of proper names without any clue to what those masters have to say. Thus, Galezowski is mentioned six times in the index, without any clue to the topic on which he is supposed to be quoted as an authority.

We doubt, amongst other assertions made by our author, whether he has material support amongst the profession in advocating dilatation of the pupil by the instillation (repeated if necessary) of a one-per-cent. solution of atropine preparatory to the extraction of cataract.

In conclusion, Tiffany's text-book is valuable. Every medical man will find helpful advice in its pages. May its minor faults be corrected for a second edition at no late date!

J. A. S.

VIII.—**Ophthalmic Myology: A Systematic Treatise on the Ocular Muscles.** By Dr. G. C. SAVAGE, of Nashville, Tenn. Published by the author. Pp. 567.

This most attractively printed, spaced, papered, and properly indexed treatise, of more than five hundred pages, on the muscles of the eyes, seems to embrace everything that can possibly be said on a topic concerning which there always has been and always will be differences between the learned members of our specialty. Whether defective refraction of the eye, alone, or defective innervation of the nerve-centres, is the origin of ocular muscular disturbances must always remain in doubt. When we see interminable exercises with prisms, and repeated partial tenotomies, marginal tenotomies, or advancements failing to cure a patient, we despair. When we find similar failures after skilful refractive-corrections, we are still in despair. And if occasionally we cure a case by an operation in which we know that we

have done absolutely nothing to reduce the strength of the stronger muscle or to increase the power of the weaker, then we are impressed with the idea that the beneficial result has come from nothing else than a variety of hypnotic suggestion. Nevertheless, no matter how a single case is improved, the professional man of to-day must keep abreast with the current of special progress and must understand the latest advances in ophthalmic myological investigations. This being so, in no other book than this one can more careful diagnosis and treatment of muscular defects be found.

We regret to observe the use of the word "tort" as a verb, because no dictionary authorizes it as a verb, whilst as a noun changed into a verb it expresses a more violent twisting than the muscles can ever possibly effect upon the eyeball.

It is a pleasure to find some excellent sketches of a new operation for advancement, because they render minute yet unsatisfactory word-explanations superfluous. Would that the somewhat enigmatical descriptions of operations for partial tenotomy and its varieties had likewise been illustrated, in the direction of lucidity!

The rules and designs for discovering which eye and which eye-muscles are affected in a given case of paralysis of the ocular muscles are excellently clear, and worth memorizing on the chance of our meeting now and then with similar cases of this oftentimes puzzling affection.

The skilled ophthalmic surgeon can predict almost precisely his percentage of successes and failures in any given hundred successive cataract-extractions, for example. In this book, however, as well as in others of its class, we fail to find a single hint regarding a patient's chances of cure from exercises or operations in any given series of a hundred cases of heterophoria or heterotropia. The only assurance offered that patient, or the student in ophthalmic myology, is that in suitable cases much benefit may be obtained by this treatment or that. Is not this then, as it were, a confession of average failure in a majority of the cases of muscular imbalance in so far as any successful devices have as yet been discovered by the exploiters of modern ophthalmic myology? J. A. S.

IX.—**Visual Economics, with Rules for Estimation of the Earning-Ability after Injuries to the Eyes.** By Dr. H. MAGNUS, of Breslau, Germany, and Dr. H. V. WUERDEMANN, Milwaukee, Wis. Published by C. Porth, 105 Grand Ave., Milwaukee.

This book opens up a new path into the realm, so far but little explored in this country, of the actual mathematical and proportional valuation of loss of sight amongst the working classes. It begins with criticism of the formulæ established by other writers, and in their place constructs better and fairer values in so important a domain of accident insurance and legal medicine. This is an epoch-making work, in that it gives us a clue how to dispense with conflicting expert testimony in suits for damages or alleged malpractice after operations on the eyes. Its numerous illustrated curves for loss of sight under different conditions of previous good sight in both eyes, or in but one, or in cases of paralysis of the ocular muscles, or for occupations making greater or less demands upon the eyesight, etc., facilitate rapid determination of a proper money indemnity, fair alike to the workman and to the employer. We commend the book highly to the profession, to insurance men, and to the bar.

It is a pity, however, that the proof had not been previously submitted to some good English scholar, for its pages bristle with constant misuse of "shall" for "will," "should" for "would"; many of the sentences are excessively long and involved; there is altogether too frequent use of what seems to us that compound term, "acuity of vision," when "vision" or "sight" alone could well be substituted, to say nothing of such occasional errors as "*injuring a factor.*" Outside of its errors of grammar and style, this book is extremely valuable in its particular province. J. A. S.

X.—**A Manual of Ophthalmoscopy** for students and general practitioners. By Dr. J. E. Jennings, St. Louis. Small octavo, pp. 180, with nearly a hundred illustrations, mostly new. Philadelphia, 1902: P. Blakiston's Son & Co.

The author has presented in a condensed and didactic way the elements of ophthalmoscopy. The book is accurate in the main, though it is rather careless to misspell the names of two authorities quoted in two successive lines, and occasionally the remarks on anatomy and pathology will appear strange to the advanced student. As a handbook for students taking ophthalmoscopic courses it will be appreciated. W. A. H.

XI.—**Neurological Technique.** Some special histological methods employed for the study of the nervous system, together with a laboratory outline for the dissection of the central nervous

system and neurological nomenclature [BNA] arranged in a classified list. By IRVING HARDESTY, Ph.D., Instructor in Anatomy, the University of California; formerly Assistant in Neurology, the University of Chicago. Octavo, pp. 180. 1902: The University of Chicago Press.

The author by omitting much of the obsolete in technique has produced a book of convenient size, and by arranging its contents very systematically has made it an excellent handbook. There are very precise directions for carrying out the new stains now generally used, such, for example, as Nissl's, Bethe's, Marchi's, Weigert's, and Mallory's, with intelligible reasons for the various steps followed. The book, therefore, will be of great service to those who, not having had the training of the neurological laboratory, wish to study the retina, optic nerve, and the more central portions of the visual pathway by means of neurological methods. W. A. H.

XII.—**Year Book of Surgery,** 1902, volume ii. Edited by G. M. GOULD, M.D. Published by W. B. Saunders & Co., Philadelphia. Price, cloth, $3.00; half morocco, $3.75.

The Year-Book for 1902 maintains the high rank set by its predecessors. The chapter on General Surgery occupies more than half the book, and furnishes a most interesting and excellent digest of the year's work. It can be particularly recommended to those engaged in special work, for whom the importance of conversance with the progress of the mother science cannot be overestimated. The chapter on Ophthalmology is by Dr. Hansell and Dr. Reber of Philadelphia, and occupies fifty pages. A fairly complete review of the year's papers is given and critical remarks by the editors are frequently added.

The editors and the publishers are to be complimented on the excellence of the contents and the admirable get-up of the book. A. K.

XIII.—**The Diagnosis of Nervous and Mental Diseases** by H. T. PERSHING, M.D., Denver, Colo. Published by P. Blakiston's Sons & Co., Philadelphia, 1901. P. 221. Price, $1.25.

This small volume is offered to general practitioners as a ready guide to diagnosis and as an adjunct to the larger text-book. The first part deals with general directions for the examination of the patient. The last and greater part appears under the heading of the recognition of special diseases. This consists of a series of diagnostic tables. A general or prominent symptom is first

described; then, arranged in groups and subdivisions, are given all the diseases — with their respective peculiar features — in which this symptom occurs. The book is unusually clearly written and complete, and in every way fulfils its purposes. A. K.

XIV.—**Leçons de thérapeutique oculaire** by Dr. A. DARIER, Paris. Published by La clinique ophtalmologique, 9 rue Buffault, Paris. P. 386. Price, 12.50 francs.

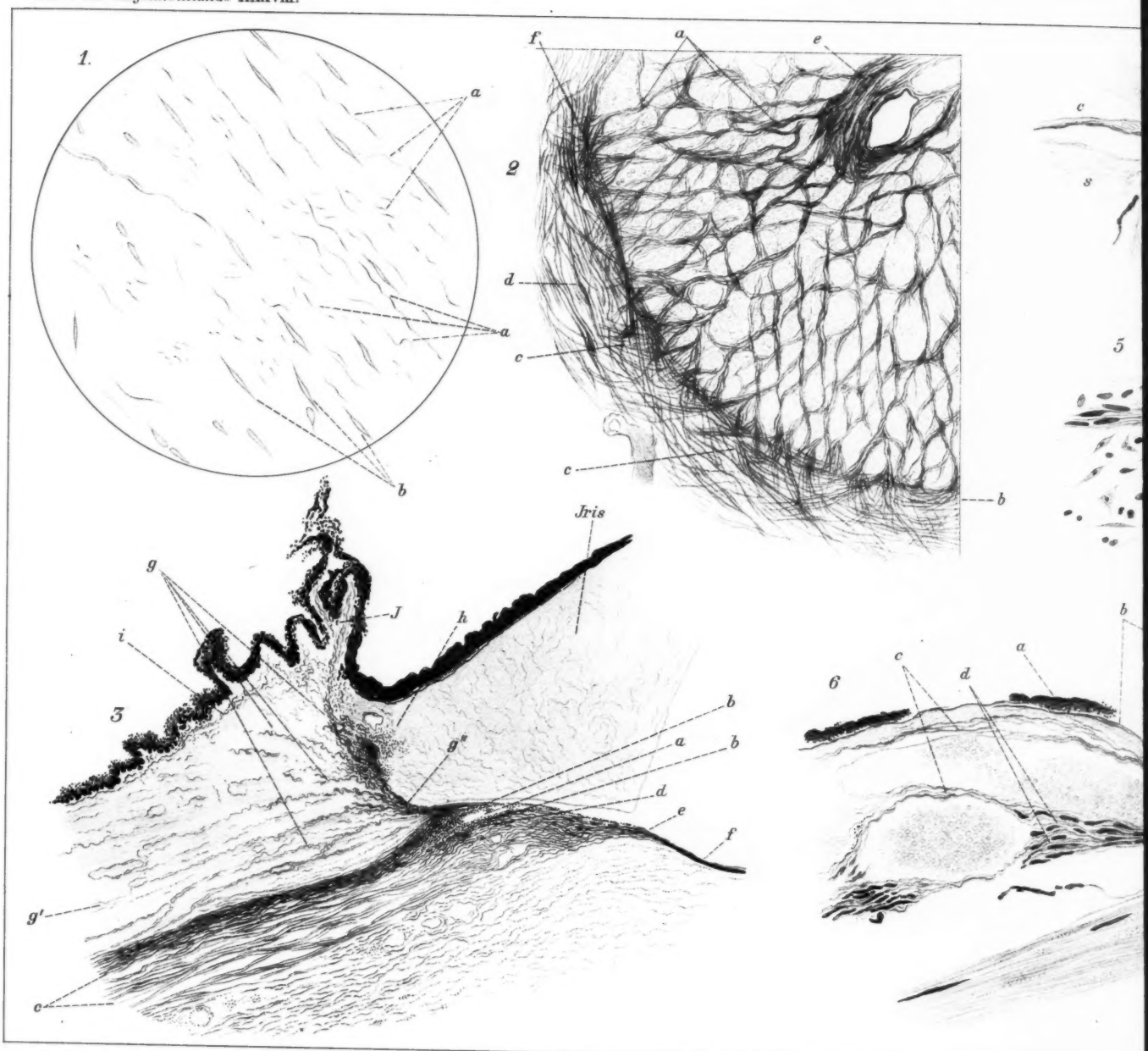
These lectures, given by Dr. Darier in 1901, now appear in book form, and endeavor to show the advance made in the medicinal treatment of eye diseases, owing to important discoveries in materia medica within the last few years. Apart from the drugs and therapeutic measures described, which are now quite well known, such as protargol, euphthalmine, holocain, adrenalin, and subconjunctival salt injections, we should like to draw attention to the following three:

1. The author prefers the intravenous injections of a soluble mercurial salt, such as the cyanide of mercury, in anti-syphilitic treatment.

2. The use of acoine,—a few drops of a 1 % solution are added to the medicament to be injected under the conjunctiva, to render the injection painless.

3. Dionine, a hydrochlorate of ethylmorphine, is a powerful ocular analgesic. Instillations of a 5 % solution are said to relieve for hours the violent pains of any deep-seated inflammation of the eye.

In addition to the description, methods of application, and indications for the use of these newer remedies, this book gives the treatment of almost all ocular diseases. Though the author's views are perhaps too enthusiastic to be shared by all, they will be read with interest by every one. A. K.



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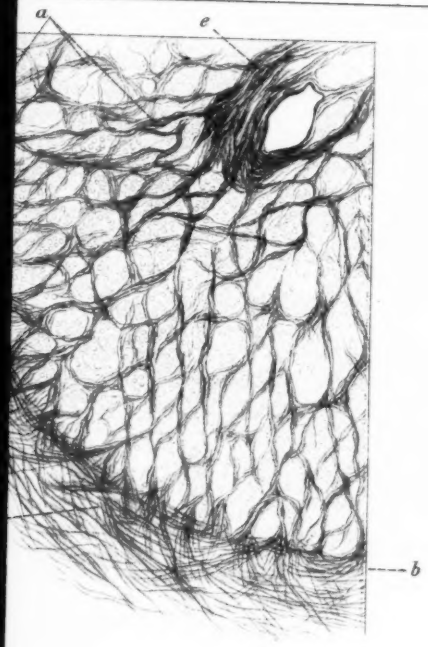

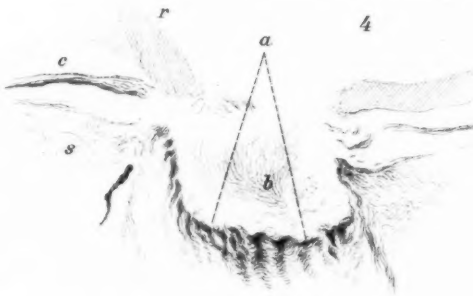

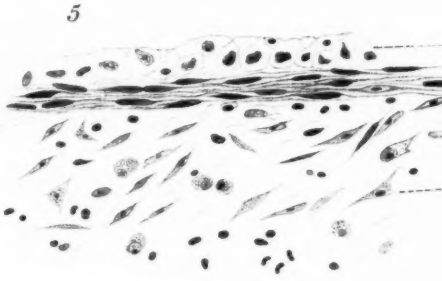

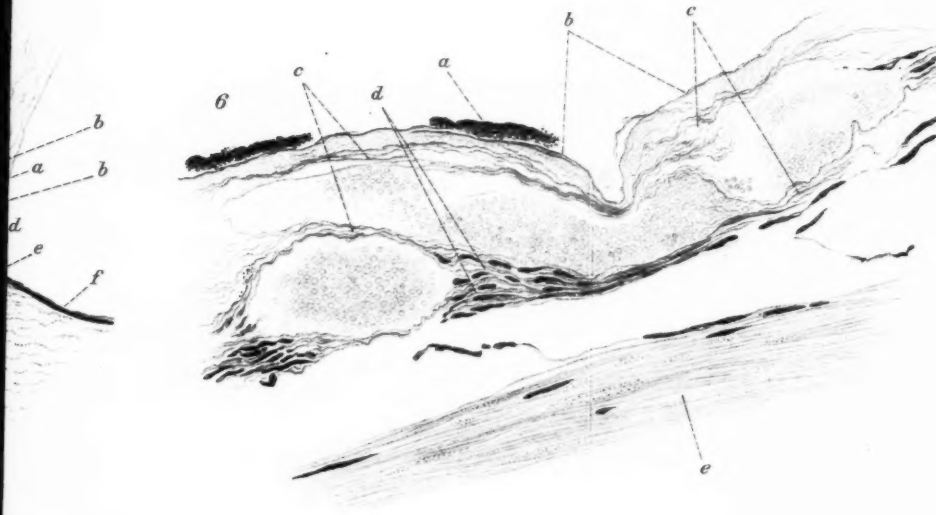

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